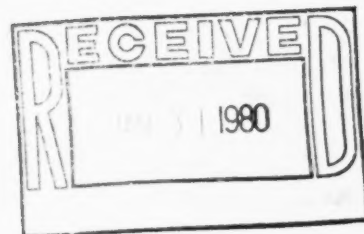


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PIT & QUARRY

January, 1980



Taking off into the eighties . . .
Can industry weather the storm?

1979 REVIEW & 1980 OUTLOOK

ON THIS MONTH'S COVER



As the decade ends, we review 1979 industry performance and consider the outlook for the first year of the eighties. (Illus. by Janet Wilcox).

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Executive and Editorial Offices: 105 W. Adams St., Chicago, Illinois 60603. Phone (312) 726-7151.

PIT & QUARRY is published monthly. Copyright 1979 by Pit & Quarry Publications, Inc. Controlled circulation postage paid at Pontiac, Illinois 61764 and Chicago, Illinois 60607. In changing address, please give old as well as new address.

Subscription prices: U.S., U.S. Poss. and Canada, 1 Year \$18.00. All other countries, 1 Year \$60.00. Single copies: \$2.00 each to U.S., U.S. Poss. and Canada. All other countries, \$4.00 each. (payable in U.S. funds only)

Member of:
American Business Press, Inc.
Business Publications Audit of Circulation, Inc.
Associated Equipment Distributors

Pit & Quarry is indexed by Engineering Index, Inc.
Copies of back issues are available on microfilm from Xerox University Microfilms, 300 N. Zeeb Road, Ann Arbor, Michigan 48106.

INTERNATIONAL STANDARD SERIAL NUMBER: ISSN 0032-0293 (registered in National Serials Data Program, Library of Congress, Washington, D.C. 20540)

Postmaster: Please send form 3579 to Pit & Quarry Publications, Inc., 105 W. Adams St., Chicago, Illinois 60603



PIT & QUARRY

ISSN 0032-0293

The basic magazine in a basic industry

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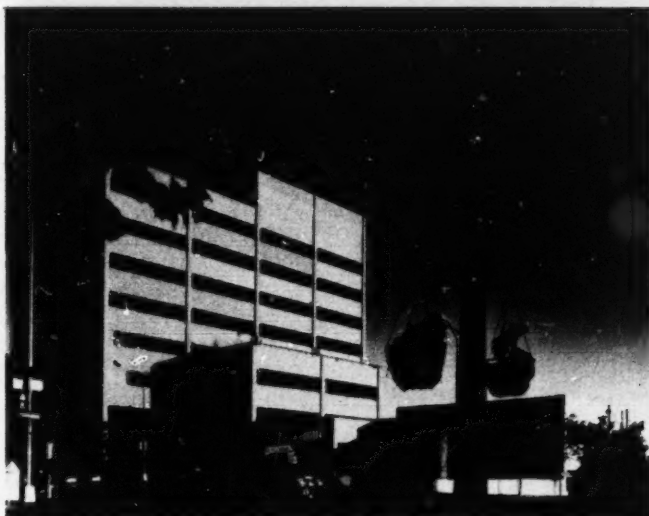
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Construction

**Inflation, high interest rates
slowed progress in '79;
expect parallel in '80**



BY JIM KOSTKA

Although there was no glaring evidence that construction was on the decline late in 1979, there were some underlying signs that indicated that the four consecutive years of growth by this industry had come to an end. Construction's anticipated 1979 gain of 8% in dollar volume will not be enough to offset inflation which reached a rate of about 13%. This means that actual physical construction put-in-place slipped below the 1978 level.

In an effort to control inflation, the prime interest rate was raised a number of times during 1979 finally reaching a high of 15.5% in November. The purpose of this action, of course, was to make money more difficult to borrow. With money harder to obtain through loans, less was being spent, especially on projects requiring substantial amounts of capital such as construction. This action began to slow the pace of building activity early in the year and the slowdown continued for the remainder of 1979.

Along with the decline in construction in general came a drop in housing starts which had been up around the 2 million unit level in 1977 and 1978. By late in 1979, housing starts had declined to an annual rate of approximately 1.7 million units, indicating that the high interest rate money policy was producing the results for which it had been initiated.

In addition to the drop in the housing market, the \$6 billion

Local Public Works Act expired. This tended to further curtail publicly financed construction, leaving only commercial and industrial building to sustain the flow of new construction projects, but, with the economy moving toward a recession, support from the private nonresidential sector was rapidly waning.

Indications are that the Federal Reserve Board will continue to manipulate the prime interest rate until the rate reaches a point where it deters inflation and holds it in check. After that has been accomplished, the prime interest rate will be dropped gradually to stimulate the economy. It appears now that an annual inflation rate of 8% is the government's aim. This may be further supplemented by a reduction in the federal income tax in 1980.

Outlays for new construction in 1980, according to information provided by the U.S. Department of Commerce, Bureau of Census and Bureau of Domestic Business Development, are expected to amount to \$223 billion—only \$500 million above the 1979 total. Based on 1972 constant dollars, this represents a decline of 9% in actual physical volume of work put-in-place.

Private construction

Most of the 1979 rise in construction spending was from privately owned construction rather than from the public sector. Private construction reached a total of \$176.3 billion in 1979 for a gain of \$15.9 billion over the previous

year. Expectations for private construction in 1980 call for an \$800 million decline which would bring this type of construction down to the \$175.5 billion level. Much of this drop will be the result of the 13% decline in housing starts expected in 1980.

Public construction

The public sector, which accounted for about 20% of all construction outlays in 1979, reached \$46.25 billion—a modest gain of 1% over 1978. A slightly better performance is expected from this sector in 1980 when the value of its construction is supposed to climb to \$47.5 billion—a gain of almost 3%. There was a spurt in public construction in 1978 when federal government emergency public work funds were released.

In 1979, this sector moved laterally with some of the categories such as hospitals and water supply facilities, declining. Other categories—like housing and redevelopment, industrial, educational, highways and streets, military facilities, conservation and development—registered enough gain to keep the public construction sector in the black, but not by much.

The U.S. Department of Commerce projections on construction activity in 1980 are based on the assumption that the U.S. will have a recession of moderate depth and duration. It feels that real GNP (Gross National Product) will decline in the first half of 1980, then start to climb during



San Francisco's George R. Moscone Convention Center will require 120,000 cu. yd. of concrete. The general segment of public

construction dropped to \$4.45 billion in 1979, and is expected to decline further in 1980 and reach a total of \$4.15 billions.

the second half of the year. It also assumes that interest rates for long term funds will peak early in 1980 and will not decrease significantly during the rest of the year. Many public works projects on the state and federal levels are likely to be deferred in 1980 due to the high cost of borrowing money. Furthermore, a conservative policy of federal aid to projects normally dependent upon such aid should reduce the possibility of a resurgence of public construction activity. Emergency public works legislation enacted in 1976 is not expected to offset the anticipated decline in private residential and nonresidential activity.

Even though the cost of construction loans and long-term permanent financing loans was higher than at any time since World War II, funds for underwriting the huge construction market of 1979 were generally available. Savings institution deposits were down from 1978 levels, but these institutions attracted investors in six month savings certificates with rates of return tied to the weekly market rate of six month Treasury bills. This helped satisfy residential mortgage market demands. Widespread withdrawal of funds from savings banks into higher yielding investments did not occur until late in the year when disparities developed between short- and long-term interest rates. The increasing volume of foreign investment capital, however, helped finance commer-

cial and industrial construction during 1979.

Mortgage money was available during most of 1979. This helped moderate the decline of the housing market. But, late in 1979, there was a deterioration in the mortgage market when rates escalated and available money began to dry up.

The downturn in the housing market is expected to continue through the first half of 1980 due to more restrictive lending policies involving high down payments and peak interest rates. It appears that the 12-13% mortgage rate, which was common late in 1979, will begin to turn downward until the latter part of 1980.

Residential construction

During the first half of 1979, residential construction was stronger than anticipated. Second quarter housing starts were well over 1.8 million units on a seasonally adjusted annual basis, placing the rate about 10% below the 2 million starts in 1978.

Starts for the entire year of 1979 totaled 1.75 million units, reflecting a market influenced by construction costs that rose 13.8%, rapidly rising sales prices, and an increasing inability of potential buyers to afford houses being offered. Financing, generally, was relatively easy to obtain but at mortgage rates that continued to climb throughout the year. An adequate supply of lending money was on hand because of the high interest rates offered by various savings institutions, mak-

ing saving money more attractive than borrowing it.

Indications are that housing starts in 1980 will drop to around 1.4 million units. This decline from 1979 will not be due to a lack of demand but because of recessionary influences. Basically, the demand for new housing is strong because of a high rate of household formation and the trend toward using home ownership as a hedge against inflation. A growing number of two-income families, as well as the rapid increase in the purchase of older homes, has helped keep new homes affordable and offset much of the impact of extremely high interest rates and steeply rising prices for these homes.

A low vacancy rate, less than 5%, also will aid the 1980 housing market. Conversely, growing pressures for rent control in many communities, which serve as a threat to potential investors in rental housing, have kept multi-unit construction at a low rate. Almost 600,000 multi-units were started in 1977 and 1978. During 1979, multi-units fell to about 550,000.

The 1980 distribution of new housing starts, about 950,000 units in single-unit structures, represents a decline of 20% from 1979; 450,000 in multi-unit structures reflects the continuing advantage of home ownership.

It is anticipated that the housing recession will bottom out in the first quarter of 1980. This will be followed by a slow but steady recovery. Mortgage rates will re-

Type of Construction	(in millions of current dollars)		Percent change 1978-79	1980 ¹	Percent change 1979-80
	1978	1979 ¹			
Total new construction	208,224	222,500	8	223,000	1
Private construction	180,403	176,250	10	175,500	1
Residential buildings	83,425	87,500	4	89,500	8
New housing units	75,808	77,000	2	87,500	-12
Additions and alterations	16,360	18,500	13	20,000	8
Nonhousekeeping	1,267	2,000	58	2,000	0
Nonresidential buildings	96,293	45,450	25	49,900	10
Industrial	10,894	15,000	36	17,500	17
Office	6,574	8,900	35	9,600	8
Other commercial	11,991	14,400	20	15,000	4
Religious	1,248	1,450	16	1,550	7
Educational	729	850	17	950	12
Hospital and institutional	3,347	3,500	5	3,850	10
Miscellaneous	1,410	1,350	-4	1,450	7
Firm, nonresidential	5,253	5,700	9	6,250	10
Public utilities	24,148	26,300	9	28,450	8
Telephone	5,418	5,900	9	6,400	8
Electric light and power	14,915	15,750	6	16,350	4
Gas	2,244	2,600	25	3,400	21
Railroad	1,037	1,200	16	1,450	21
Petroleum pipelines	534	650	22	850	31
All other private	1,263	1,300	1	1,400	8
Public construction	45,821	46,250	-1	47,500	3
Buildings	15,236	15,000	-2	15,400	3
Housing and redevelopment	1,053	1,200	14	1,300	8
Industrial	1,183	1,300	10	1,400	8
Educational	6,264	6,450	3	6,650	3
Hospital	1,822	1,800	-12	1,900	10
Other public	4,914	4,450	-9	4,150	-7
Highways and streets	10,709	11,000	3	11,000	0
Military facilities	1,488	1,850	10	1,850	12
Conservation and development	4,435	4,700	6	4,850	3
Other public construction	13,943	13,900	2	14,400	4
Sewer systems	6,785	6,750	1	6,800	1
Water supply facilities	2,661	2,150	-19	2,200	2
Miscellaneous	4,517	5,000	11	5,400	8

Source: Bureau of the Census and Bureau of Domestic Business Development (BDBD).

¹Estimated by BDBD. ²Less than one-half of 1 percent.

main high in 1980, staying around 12% early in the year. If inflation eases, mortgage rates could drop to about 11% late in the year.

Expenditures for new housing in 1977 amounted to \$77 billion. Dollar outlays for this category in 1980 are expected to fall to \$67.5 billion, a drop of 12%.

As has been the case in the past, 1979 housing expenditures on additions and alterations rose 13% to \$18.5 billion. When the housing market becomes tight, people tend to make do with what they have by repairing and remodeling. A further increase of 8%, which would bring it up to \$20 billion is looked for in this sort of construction in 1980.

Nonhousekeeping

This sector is made up of private nonresidential buildings, largely hotel and motel construction. In 1979, this type of construction jumped 58% over the previous year to a total of \$2 billion. Uncertainties about future gasoline supplies and the rising cost of travel should curtail construction expenditure growth of this type in 1980 so that it will remain virtually the same as it was in 1979.

Private nonresidential buildings

Enjoying a gain of 25% and reaching a total of \$45.45 billion in 1979, this sector was definitely the strongest in the entire construction market. Except for mis-

cellaneous buildings, all types of nonresidential buildings showed gains in 1979 over 1978. Increases ranging anywhere from 5% for hospitals to 36% for industrial buildings were recorded.

Industrial construction, which amounted to \$15 billion, represented nearly one-third of all construction in the nonresidential building category. Also providing substantial gains for this group were the office and other commercial (shopping centers and stores) segments with respective gains of 35 and 20%. Construction of educational facilities moved upward 17% and religious building rose 16%. Hospital and institutional construction followed with a 5% increase.

All segments of nonresidential building construction are counted on to show gains in 1980, but at a lesser rate than in 1979. The category as a whole will be up 10%, with these increases for the various segments: industrial, 17%; office, 8%; other commercial, 4%; religious, 7%; educational, 12%; hospital and institutional, 10%; and miscellaneous, 7%.

Farm construction

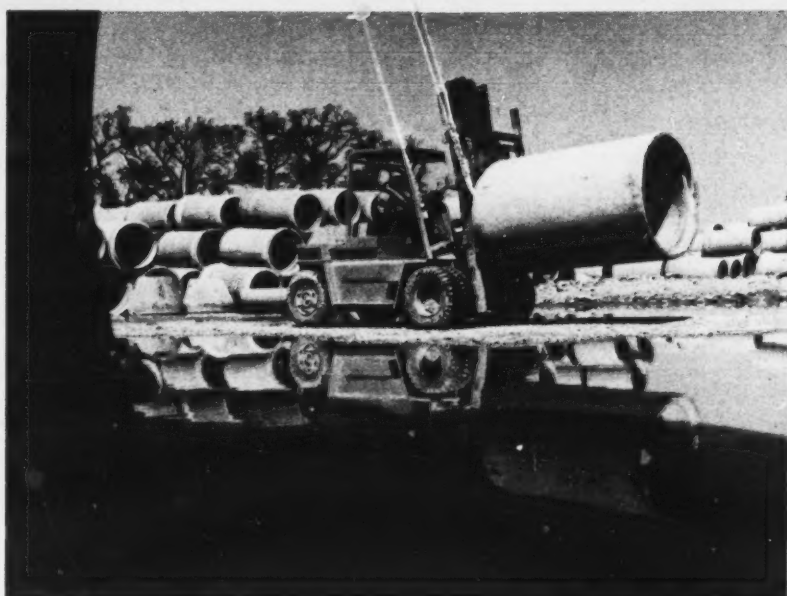
Over the past few years, there has been no significant change in the trend of spending for nonresidential farm construction. In 1979 this category accounted for \$5.7 billion in construction, up 9% from the year before. A slightly higher increase of 10% is anticipated in 1980 which would bring this category's total to \$6.25 billion.

Public utilities

Total new construction value put-in-place for the public utilities sector rose by 9% to \$26.3 billion in 1979. Adjusting for inflation the overall physical volume was about equal to that of 1978. The 1980 picture for this sector looks about the same with an anticipated 8% increase in dollar outlays and a stable physical volume after accounting for inflation. This should bring the total up to \$28.45 billion.

The telephone and electric light segments registered moderate growth rates of 9 and 6% in 1979. Gas, railroad and petroleum pipeline construction had substantially higher rates of increase with gains of 25, 16 and 22%, respectively. These three segments will continue to show increases in the 20-30% range in 1980 while the telephone and electric light segments will gain less than 10%.

A combination of a slowing economy and the downtrend in housing slowed telephone construction in 1979 and is expected to do the same in 1980. The electric light and power segment growth possibilities are being stifled because of an anti-nuclear power attitude by some of the people. Costs of plants of this type are rising rapidly too, making this source of energy less attractive.



There will not be much of a change in the value of new system construction in 1980, when it reaches \$6.8 billion. In 1979 this type of construction amounted to \$6.75 billion.

Public construction

All new construction of publicly owned facilities edged up only 1% in 1979 with a total value of \$46.25 billion. A slightly better performance is forecast for 1980 when public construction should climb to \$47.5 billion for a gain of 3%. The rather poor showing of this type of construction was due partly to the depletion of federal government emergency funds that were used for public construction in 1977 and 1978, and to a lesser degree in 1979.

Public buildings

Combined, the five public building construction segments declined about 2% in current dollars in 1979, although three of the segments showed some increases. Hospital construction dropped by 12%, and public office buildings showed a decline of 9%. The overall 3% rise forecast for the buildings sector in 1980 is based on the anticipated rebound of the hospital segment to a record level. This does not represent a continuing trend, but rather a temporary spillover from the weak private hospital market of recent years which, in turn, reflects a growing dependence on publicly owned facilities.

Educational buildings, which represent the largest public buildings segment, showed a 3% rise in

1979 and probably will have a similar increase in 1980. In real volume terms, this means about a 10% decline for two successive years.

Construction of other public buildings, which are mostly office buildings, was down 9% in 1979 and will be around 7% in the red in 1980. Limitations on employment at the federal, state and local government levels has been at least partly responsible for the reduction of this type of construction. Also contributing to the decline may be the drying up of budget surpluses which had been enjoyed by many local governments over the past few years.

Highways and streets

On a dollar basis, construction of highways and streets has moved laterally the past several years. In 1979, this category accounted for \$11 billion in construction, representing a gain of 3% over 1978. Construction in 1980 is predicted to stay at the same dollar level. With the long-term interstate highway near completion and with toll and tax losses in 1979 because of the shortage of gasoline during part of the year, local highway expenditures will tend to favor the repair and upgrading of existing roads rather than new road construction. Work on bridges also is

expanding and helping to maintain overall outlays for the highway category.

Sewer systems

Construction of sewer systems didn't live up to expectations in 1979. This was disappointing in view of the backlog of projects that existed. The \$6.75 billion in sewer construction in 1979 was practically the same as it was in 1978. A very minor rise of 1% appears to be in line for 1980, which will bring this segment up to \$6.8 billion. Because of the developing recession, local governments converted whatever capital they had available to other types of construction.

Water supply facilities

This segment of construction made the poorest showing of any type of construction in 1979. Its value dropped 19%, pulling the total value down to \$2.15 billion. A recovery of only 2% appears to be in store for 1980, bringing the year's total up to \$2.2 billion. This is far below the \$2.66 billion attained by this construction segment in 1978.

In addition to a lack of funds at the local government level, the drop in housing was a dominant factor in the poor showing of construction of water supply facilities. Existing facilities apparently were adequate to meet the current needs.

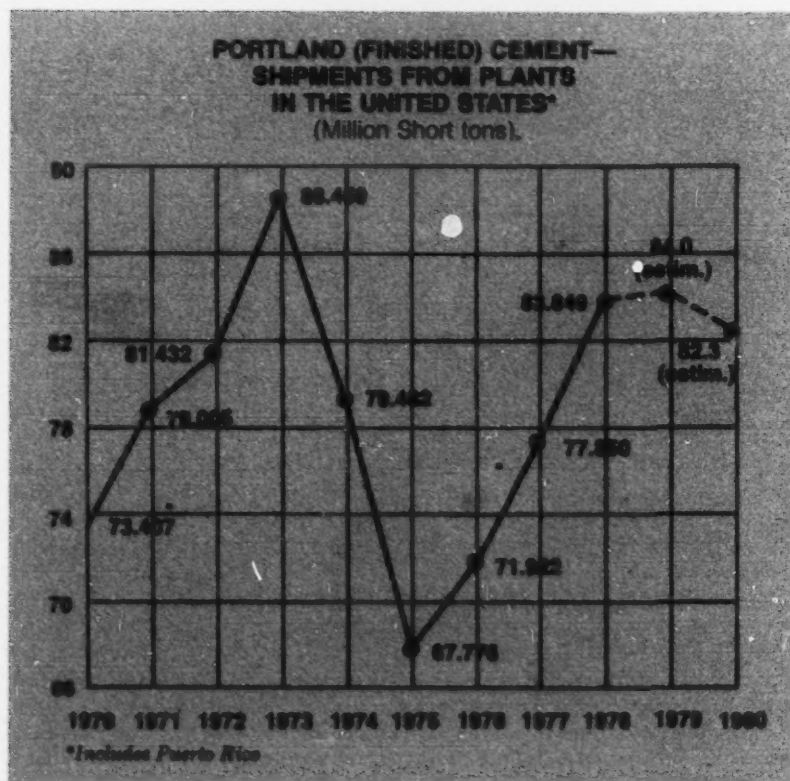
Miscellaneous

The miscellaneous segment of other public construction includes electric power and generation facilities, amusement and recreation facilities, and airport and mass transit facilities. This construction posted the best percent of gain of any public construction segments with an 11% increase. Its total for 1979 was \$5 billion. The upward trend should continue in 1980 with an increase of 8% and a total of \$5.4 billion. Its physical volume level, unlike most other construction segments, has been stable for three years and almost at the peak of 10 years ago.

Portland Cement

Production and project survey

BY SID LEVINE



The demand for portland cement in 1979 turned out to be greater than had been estimated earlier in the year. 1979 cement shipments from plants in the United States and Puerto Rico probably will amount to 84 million short tons. This total represents slightly more than that of 1978 and is the highest shipment figure since the record year of 1973.

In contrast to 1978, no shortage conditions have been reported in 1979. (Cement users in many areas of the country, primarily in the West and Midwest, reported delays or other difficulties in obtaining cement in 1978.)

Estimated 1979 imports of cement and clinker are expected to total a record 11 million tons, 67% above the 1973 record and con-

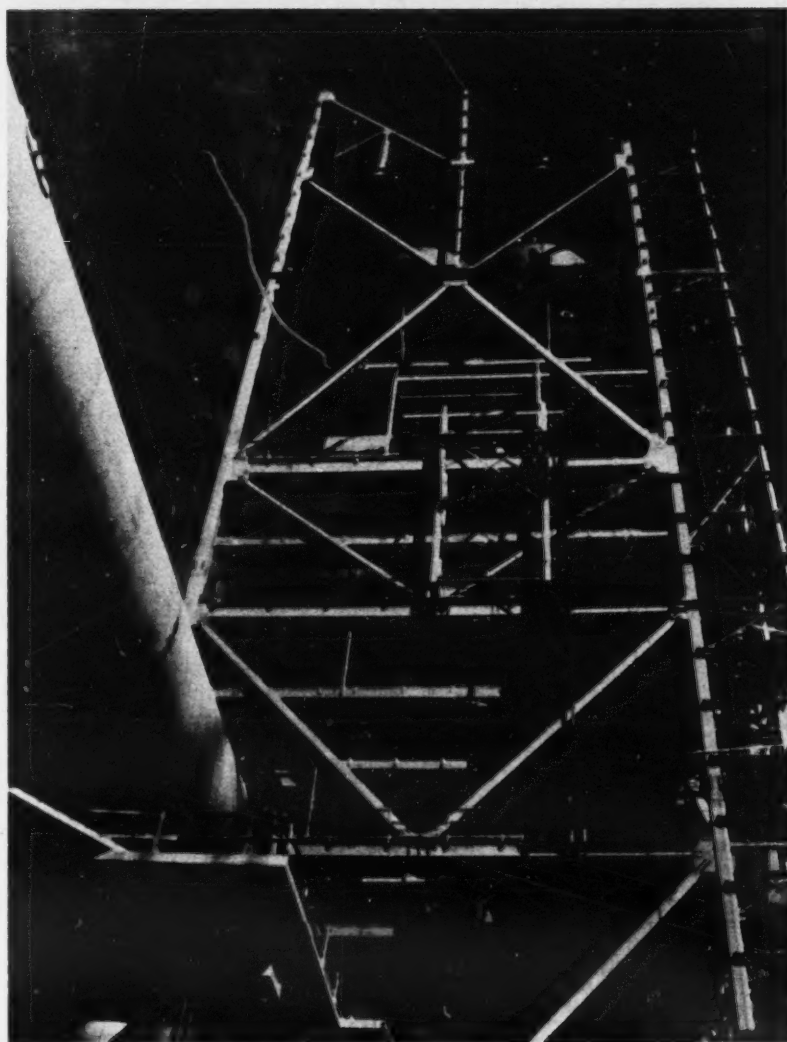
1979 figures in this report represent estimates. This is due to the time lag between actual shipments and when figures are reported by agencies that track the cement industry.—Ed.

stituting about 13% of the year's portland cement shipments. As in 1978, exports may total less than 0.1%.

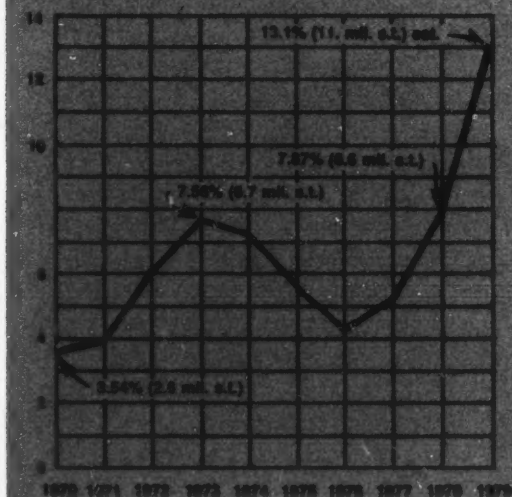
U.S. finished portland cement production is delineated by the Bureau of Mines in terms of shipments from mills (i.e., plants). (Mill shipments data comprehends cement ground from clinker manufactured in kilns in the United States and Puerto Rico, cement ground from imported clinker, and cement imported and distributed by domestic producers only.)

In 1978, cement manufacturing plants in the United States (including Puerto Rico) produced 75.5 million tons of clinker, and imported 3 million tons, to grind 81.4 million tons of portland cement. Domestic producers shipped 83.8 million tons of portland cement, which included 2.4 million tons of imported cement. Stocks decreased by 0.7 million tons. Additionally, 989,000 tons of portland cement were imported and shipped by others not producing cement. Puerto Rico shipments averaged 2% of total shipments in the five-year period 1974-78.

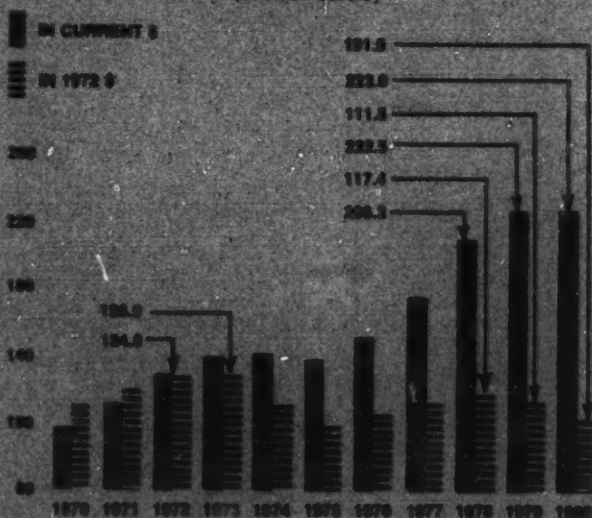
Reinforced suspension preheater system is scheduled for 1981 startup at Marquette Cement's 1.2 million tpy plant at Cape Girardeau, Mo. (Courtesy: Allis-Chalmers)



CEMENT AND CEMENT CLINKER—IMPORTS FOR CONSUMPTION
(As percent of total shipments from plants and of million short tons)



VALUE OF TOTAL NEW CONSTRUCTION PUT IN PLACE IN THE UNITED STATES
(in billion dollars)



Source: U.S. Dept. of Commerce

Based on late 1979 prices, the value of portland cement shipments for the year may exceed the \$3.413 billion value of 1978 by 11% to 15%. The average value per ton for portland cement was \$36.36 in 1977 and \$40.71 in 1978. The estimated average price for 1979 may be about \$46 per ton.

Shipments of masonry cement may show an 8% drop in 1979 from the 4.15 million tons shipped by producers in 1978. The average price per ton of masonry cement was \$50.53 in 1978 and \$45.03 in 1977.

Cement demand

The anticipated 1980 slowdown in construction probably will cut cement consumption by several percentage points. However, a carryover of construction work from 1979's building activity may ease the decline.

New construction spending for work put-in-place in 1980 is expected to be virtually the same as in 1979, according to a Department of Commerce prediction in the 1980 edition of its annual publication, "U.S. Industrial Outlook." This report includes one and five-year projections for major

manufacturing and service industries. In 1979, actual construction outlays were estimated at \$222.5 billion. Based on constant 1972 dollars, 1979 volume declined by about 5% from 1978.

Although at a record level, 1980 outlays would represent 9% less physical volume of work put-in-place (based on 1972 constant dollars) than in 1979. Compared to the peak physical volume of 1973, new construction activity will be about one-fifth lower in 1980.

The total value of contracts for new construction in 1980 was estimated at \$169.5 billion in the "1980 Dodge/Sweet's Construction Outlook" (prepared October 1979). According to the report, this amount is a 2% gain over 1979's dollar amount, but an 8% decline in 1980 volume when adjusted for inflation. Various economic forecasts predict 1980 housing starts to range from 1.6 down to 1.2 million, compared with 1.7 million in 1979 and 2 million in 1978.

Capacity

At the end of 1978, 380 cement kilns at 157 plants were operated by 50 companies and one state agency in 39 states and Puerto Rico. Utilization of finish grinding capacity for portland cement production averaged 77.5%. No single company accounted for more than 7% of the nation's total clinker production. The 10 leading producers provided 48% of the total clinker production capacity.

In terms of clinker production, the top 10 in descending order were: Ideal Basic Industries, Inc.,

Lone Star Industries, Inc., General Portland, Inc., Martin Marietta Cement, Kaiser Cement & Gypsum, Marquette Co., a unit of Gulf & Western's Natural Resources Group, National Gypsum Co., Amcord, Inc., Medusa Cement Co., and Universal Atlas Cement Div. of U.S. Steel Corp. These companies also produced 47% of the finished cement ground in the United States in 1978.

Clinker grinding mills in 1978 were associated with 157 clinker producing plants, six of which produced white cement. Additionally, 12 plants operated grinding mills only on imported, purchased, or interplant transfers of clinker; four of these produced only masonry cement, one plant ground both portland and masonry cements, and one plant ground only calcium aluminate cement. Utilization of apparent annual clinker capacity average 84.7%.

Uses and markets

General use and moderate heat (Types I and II) portland cement constituted 91.64% of the 83.849 million short tons of cement shipped from plants in the United States (including Puerto Rico) in 1978. The next three highest groups were: high-early-strength (Type III), 3.36%; oil well cement, 2%; portland slag and portland pozzolan, 1.31%. Other cement types shipped were: sulfate-resisting (Type V), 0.28%; white cement, 0.47%; expansive cement, 0.10%; miscellaneous (including waterproof cement and low-heat Type IV), 0.84%.

Masonry cement—shipped by producers

	(million short tons)
1970	2.98
1971	3.39
1972	3.85
1973	4.13
1974	3.43
1975	2.91
1976	3.30
1977	3.76
1978	4.15

Fig. 4

Portland (Finished) Cement—Value of Shipments From Plants in the United States

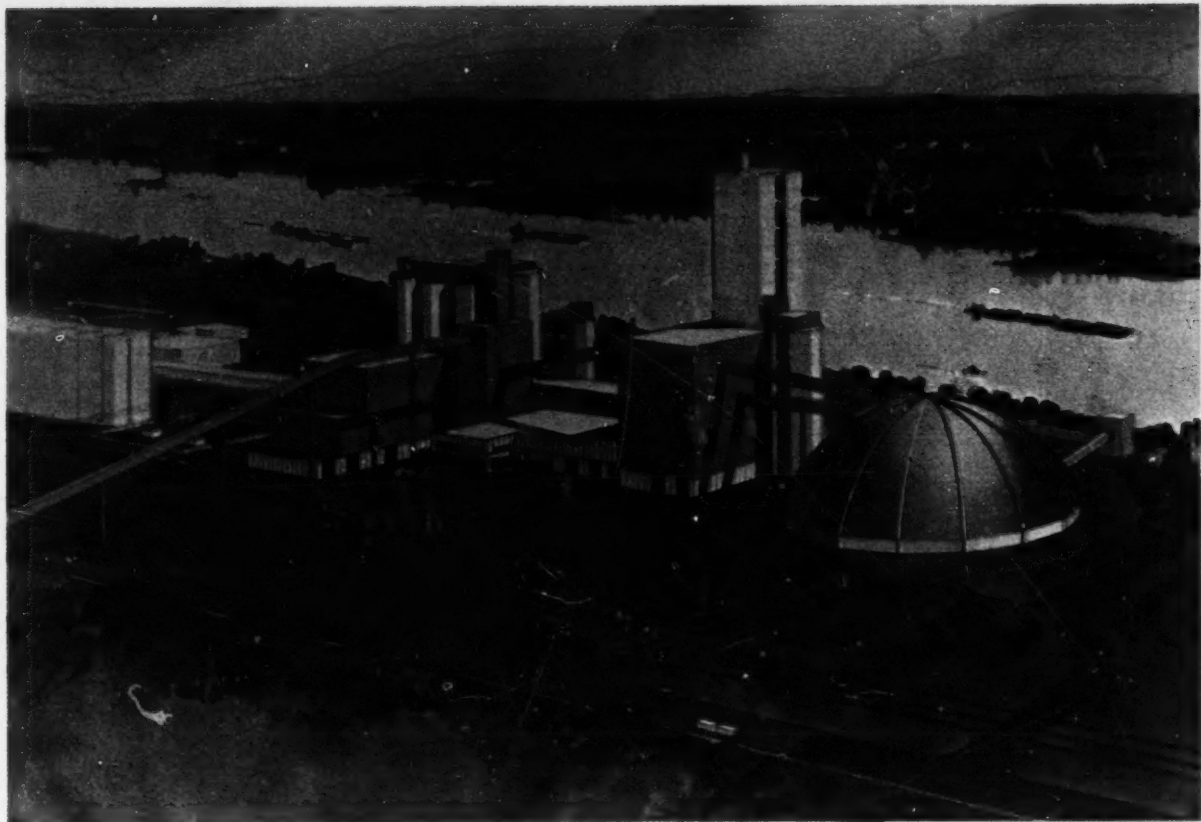
	Total value (billion dollars)	Average Value per short ton	
		in current dollars	in constant 1977 dollars
1970	\$1.30	\$17.19	\$27.36
1971	1.48	18.74	27.58
1972	1.65	20.31	28.70
1973	1.90	21.86	29.23
1974	2.11	26.52	32.30
1975	2.11	31.09	34.55
1976	2.44	33.86	35.74
1977	2.83	36.36	36.36
1978	3.41	40.71	37.38
1979 (est.)	3.9	46.0	41.4

Fig. 5

U.S. Cement Consumption by PCA Region

	(million short tons)	
Region	1977	1978
Eastern	12,580	14,007
Great Lakes-		
Midwestern	14,086	14,771
Southeastern	12,161	13,682
North Central	5,228	5,384
Rocky Mountain-		
Northwest	6,383	6,848
Pacific Southwest	10,720	11,363
South Central	15,952	17,215
Total	77,080	83,250

Fig. 6



Martin Marietta's 850,000 tpy coal-fired dry process plant in Buffalo, Iowa is scheduled for completion in 1981.

Ready-mixed concrete producers accounted for 67% of portland cement shipments by domestic producers in 1978. Concrete products manufacturers used 13.8% to make concrete block, pipe, precast, prestressed, and other concrete products. Building material dealers received 7.9% of the total portland cement shipments. Highway contractors used 4.9%, and other contractors used 4.5% of the total. The remaining 1.9% was consumed by various government agencies and for various miscellaneous uses.

Forty-four percent of the 1978 portland cement production came from six states: California, Texas, Pennsylvania, Michigan, Missouri and New York. U.S. cement consumption in 1977 and 1978, by Portland Cement Association regions, are given in Fig. 6.

Corporate changes

Acquisitions by foreign interests and mergers by U.S. conglomerates continue to change the corporate face of the United States cement industry. This

trend of the past several years is shown in Figs. 7 and 8. Estimates of U.S. cement capacity held by foreign interests range between 10 and 14%.

San Antonio Portland Cement Co., with a 470,000-tpy wet process plant in San Antonio, Tex., was purchased last year as a joint venture by Presa S.P.A. Cementeria di Robilante of Italy and Cementwerke Vigier A.G. of Switzerland. IFI International S.A., a European holding company based in Turin, Italy, purchased Missouri Pacific Corp.'s subsidiary River Cement Co. in 1979. River Cement's dry-process plant, located in Festus, Mo. (about 35 miles south of St. Louis, Mo.), is rated at 1.2 million tpy and went on stream in 1965.

Florida Mining & Materials Corp. was acquired last year by Moore McCormack Resources Inc., a Stamford, Conn. steamship and mine management corporation, after a bidding contest with Kaiser Cement Corp. Florida Mining's activities include production of cement, aggregates,

ready-mixed concrete, concrete block, and precast/prestressed concrete. The cement plant, located in Brooksville, Fla. is a dry-process operation rated at 560,000 tpy.

Lone Star Industries, Inc. acquired all of the stock of the Portland Cement Co. of Utah last year. Portland Cement Co. of Utah is headquartered in Salt Lake City. The wet-process plant, currently rated at 260,000 tpy, will be producing 400,000 tpy via an expansion program to be completed shortly.

Gifford-Hill & Co., Inc. and Amcord, Inc. have entered into a merger agreement in which Amcord will become a wholly owned subsidiary of Gifford-Hill. Amcord, rated as the nation's sixth largest producer of cement, operates five cement plants in California, Arizona, Michigan, and Pennsylvania. Gifford-Hill operates one cement plant in Texas and one in South Carolina.

The Flintkote Co. has been the target for acquisition by several groups. In October, Flintkote and



Coplay Cement's new one million tpy dry process plant at Nazareth, Pa. went onstream in 1978 (Courtesy: Kaiser Engineers)



Conversion of Medusa's wet process plant at Charlevoix, Mich. to the dry process, scheduled for 1980 operation, will increase capacity from existing 2400 tpd to 4400 tpd (Courtesy: Kaiser Engineers)

have entered into an agreement for the acquisition of Flintkote by Genstar. Upon successful completion of the tender offer, Genstar intends to operate Flintkote as a separate subsidiary under its present management. At the time of writing, an acquisition proposal for Flintkote by Louisiana-Pacific Corp. was still under consideration by Flintkote's Board of Directors.

New and planned projects

Start-ups, modernizations, and expansions of cement plants in 1978 and 1979, and projected installations are listed in this annual Pit & Quarry survey. About 9 million short tons of added capacity of clinker and cement are slated for the 1979-1981 period, with an additional 5 million tons on the books. Some older plants probably will close, thereby reducing net increases in cement capacity.

A Department of Commerce forecast issued last year ("1979 U.S. Industrial Outlook") predicted that portland cement output probably would rise at a compound average rate of 2.8% in the five-year period 1978-83. The cost of building a new energy-efficient plant meeting environmental standards now is about \$100 per ton of annual capacity or about \$50 to \$100 million for average-sized new plants.

Cement plant data

Alamo Cement Co. (subsidiary San Antonio Portland Cement Co.)

- Bexar County, Texas: New clinker producing plant is scheduled for operation late in 1981. Major equipment and process engineering will be provided by Polysius Corp. Equipment will include: Polysius roller mill for raw grinding; Polysius rotary kiln with Prepol preheater and alkali bypass; Claudius-Peters grate cooler; Polysius roller mill for coke and coal grinding; heat exchanger for recirculating vent air back to undergrate. Combined capacity from existing San Antonio plant and new Alamo Cement plant will be one million tpy.

Amcord, Inc.

- Oro Grande, Calif. (Riverside Cement Co. Div.): Addition of waste heat recovery systems to two of the plant's cement kilns, scheduled for 1979 completion, is expected to permit generation of 85% of the plant's electrical needs through utilization of the waste heat. The \$10.5 million modernization program also includes installation of new environmental control equipment.

Ash Grove Cement Co.

- Louisville, Neb.: In mid 1979, Ash Grove Cement Co. engaged Bendy Engineering Co. to provide preliminary engineering for the next phase of a modernization program at the Louisville, Neb. plant. Major equipment in this program, if approved, will include a four-stage preheater kiln with flash calciner.

California Portland Cement Co.

- Mojave, Calif.: Addition of a one-million-tpy plant to the existing 1.1-tpy cement plant is scheduled for completion in early 1981. The Kaiser Engineers, Inc. division of Raymond International, Inc. has the contract to supply engineering, procurement, and construction management services for the estimated \$100 million modernization and expansion program. Equipment will include: Fuller IHI precalciner; four-stage suspension preheater with flash furnace and 13 ft. 6 in. x 225 ft. rotary kiln section; Fuller grate clinker cooler; Allis Chalmers, 250 tph, 2,000 hp roller mill for raw grinding; Humboldt Wedag 1500 tph impact crusher; Leeds & Northrup dual computer. Coal will be supplied for the plant by the company's Soldier Creek Coal division near Price, Utah.

Coplay Cement Manufacturing Co.

- Nazareth, Pa.: A new one-million-tpy, \$50 million dry process plant on stream in 1978 replaced facilities of half that capacity at Nazareth, Coplay, and Egypt, Pa. Equipment supplied includes: Polysius Dopol size 422 cyclone-type preheater/rotary kiln with planetary cooler; Allis-Chalmers type MPS 3750, 240-tph raw roller mill; F. L. Smidth, 6350-hp finish mill; C-E Raymond

The trend to coal burning for kiln firing continues. Many companies have either taken options, entered long-term leases, or acquired coal properties. Here's what Amcord, Inc., has been doing about coal use.

"Amcord's growing participation in energy-related industries is represented by the company's operation of two coal mining companies and its newest subsidiary, Knight Industries, Inc. The company's early conversion of its cement kilns to coal firing has been rewarded with substantial savings in the cost of fuel. In addition, the company's acquisitions of additional coal properties have assured the cement operations of a reliable fuel supply and have removed the potential threat to Amcord of petroleum price increases or shortages. The California and Arizona plants are now capable of utilizing either coal, natural gas or fuel oil, enabling them to burn the most economical fuel available.

"Amcord's two coal operations are currently undergoing major expansions, with the two-year, \$12 million project nearing completion. When completed in 1979, the expansion program will more than double annual coal production capacity to more than 1 million tons.

"The increasing importance of coal in today's environment can be illustrated by the rapid increase in coal usage by the cement industry. In 1972 less than 32% of the nation's cement plants utilized coal as the primary fuel; however, at the end of 1978 this figure had jumped to almost 70%. As the market for coal expands, Amcord is assured not only of a dependable source of coal for its own needs, but also a ready supply for sale to other industrial consumers.

"The long range prospects for our coal production facilities were further strengthened this past year through acquisition of additional coal properties adjacent to the Pennsylvania operations."

Source: 1978 Annual Report, Amcord, Inc.

coal-grinding bowl-mill system; Fuller Air-Merge blending system; Humboldt-Wedag air separator; American Air Filter electrostatic precipitator; Leeds & Northrup computer control system. Kaiser Engineers provided engineering, procurement, and construction management services.

Flintkote Co., The

- Redding, Calif. (Calaveras Cement Div.): A \$40 million expansion and modernization program, scheduled for 1981 completion, will increase capacity from 290,000 to 600,000 tpy. Equipment includes: F. L. Smidth precalciner/preheater system with 4.35 x 66m rotary kiln section and planetary cooler; 150-tpd raw roller mill; Foxboro control units. Engineering is being handled by Kaiser Engineers.

General Portland, Inc.

- New Braunfels, Tex. (Balcones plant): A new 925,000-tpy, \$80 million dry process preheater plant using coal as fuel is due on stream in late 1980. Equipment supplied includes: Polysius preheater-rotary kiln unit; C-E Raymond coal mill; Mikropul dust collectors; Fuller grate clinker cooler. Polysius Corp. is doing the engineering and supplying major equipment. The West German firm of Dyckerhoff Zementwerke A.G. is acting as consultant on design and start-up.

Ideal Basic Industries, Inc. (Cement Div.)

- Theodore, Ala. (near Mobile): New 1.5-million-tpy dry process (precalciner) plant is scheduled to be on stream in 1981. Estimated cost in 1977 dollars is \$17.5 million. A quarry planned in Monroe County, Ala., will supply limestone. Equipment will include: Allis-Chalmers 4660 tpd reinforced suspension preheater system, consisting of a 260 ft. high suspension preheater tower, 16 ft. x 280 ft. rotary kiln, and stoker-type clinker cooler; Stamler feeder-breaker in quarry; two Raymond coal mills; 65 Mikropulsaire dust collectors; two 15 ft. x 48 ft. 3½ in. F. L. Smidth Unidan finish mills with 6500-hp motors; four F. L. Smidth cement coolers. This plant eventually will

replace the present Mobile plant. Brown & Root designed and is building the plant.

- Knoxville, Tenn.: Preheater-precalciner kiln was installed in 1979, replacing four kilns shut down in February, in order to convert the raw material system from wet to dry process. Capacity increased from 470,000 to 580,000 tpy. Equipment installed includes: Fuller suspension preheater with flash calciner and 12 ft. x 165 ft. rotary section; Fuller grate clinker cooler; Mikropul dust collectors; Stamler feeder-breaker in quarry.

- Boettcher, Colo.: New grate preheater kiln will replace two 50-year-old kilns, to increase capacity from 325,000 to 460,000 tpy. Scheduled for 1981 completion, the project will cost about \$34 million. The preheater is especially designed to utilize the kerogen in the kerogen-bearing limestone available in the quarry deposit. According to calculations, the kerogen will provide about one fourth of the fuel needed. Allis-Chalmers is providing the ACL system, including: 12 ft. 2 in. wide x 112 ft. 6 in. long traveling grate; 14 ft. x 15 ft. x 204 ft. rotary kiln; 1400 tpd roller mill; type MPS 3450, 110 tph roller mill; stoker cooler; 15 ft. diam. pelletizer pan.

- Devil's Slide, Utah: A new one-million-tpy plant is being

planned to replace the present 360,000-tpy plant.

- Tijeras, N.M.: Coal-burning facilities were installed in 1978. A project was authorized to add a two-stage preheater system to the existing dry process kilns to reduce fuel consumption. The estimated cost of the project is about \$4 million, with completion in late 1979.

- Houston, Tex.: Coal-burning facilities were installed in 1978.

Kaiser Cement Corp.

- Permanente, Calif.: In a \$78.5 million modernization program, a single preheater-precalciner equipped, dry process kiln will replace the present six oil-fired wet process kilns. The dry process kiln will burn coal as well as other fuels. Rated capacity will remain the same, at 1.6 million tons annually. Lafarge Consultants Ltd. of Montreal (Canada) was awarded the contract covering engineering design services, procurement assistance, and start-up responsibility. The rebuilt plant is scheduled to begin operating in mid-1980. The designed plant capacity is 1.6 million tpy. The equipment includes: an Allis-Chalmers 5,000 tpd reinforced suspension preheater with a 16 ft. x 250 ft. rotary kiln section; two Raymond coal mills; two 15 ft. x 53½ ft. Humboldt-Wedag center-

Will the cement shortage of 1978 be repeated? Can the United States meet its increasing need for this essential construction material? In its 1978 annual report, Lone Star Industries, Inc. suggests approaches for avoiding future crises in cement supply.

"Lone Star believes that the government and the cement industry can and must work together to ensure that cement supplies are available to satisfy the nation's ever-expanding needs.

"What, then, can be done to avoid a worsening crisis in cement supply?

"The cement industry, for its part, must continue to develop technology for greater fuel efficiency and accumulate capital for expansion.

"In the national interest, the government, for its part, should help in the following areas:

"Prices—By allowing a free play of market forces so that prices—in response to demand—can rise to levels where investment in new plants and technology will yield an acceptable return.

"Depreciation & depletion—By permitting depreciation allowances on a replacement-cost basis and retaining percentage depletion allowances.

"Tax credit—By increasing the investment tax credit as a spur to investment in new and efficient plant capacity.

"Double taxation—By eliminating double taxation of profits by modifying the tax on stockholders' dividends or further reducing the tax on corporate profits.

discharge raw mills, each equipped with a 5,000-hp single-pinion gear drive (preheater waste gases will be used for drying the mills).

- San Antonio, Tex. (Longhorn plant): A second preheater-precalciner tower will serve a dry process kiln installed during a partial modernization and expansion in 1975. The \$14.5 million project will double the capacity of the kiln to 5,000 tpd. Equipment includes: Humboldt-Wedag Pyroclon suspension preheater system with precalciner; new coal grinding system; additional clinker cooling; new raw meal silo.

- Lucerne Valley, Calif.: Plans for a major modernization and expansion program for this 1.015-million-tpy wet plant have been announced.

Lehigh Portland Cement Co.

- Mason City, Iowa: Completed \$25-million modernization and expansion program in 1978. New equipment includes: F. L. Smidth 500,000-tpy, four-stage suspension preheater kiln system with 13 ft. x 184 ft. rotary section, using a precalciner and a variable bypass; two C-E Raymond coal mills; Fuller clinker cooler; F. L. Smidth 15 ft. x 27 ft. 4 in. Tirax-Unidan raw mill with a 12 ft. x 9 ft. 6 in. overhung compartment for drying in the mill; a 20 ft.

"Capital gains taxes—By further reducing these to promote higher productivity and growth. Heavy capital taxes have diverted investment from basic national needs, causing U.S. industry in general to fall behind industry in other countries.

"Consolidation—By interpreting anti-trust laws to recognize the highly fragmented nature of the cement industry and the need for appropriate mergers or consolidations. This would permit operational efficiencies and the formation of capital necessary for investment in new capacity.

"Environmental regulation—By streamlining and speeding the process of environmental regulation and by permitting faster recovery of these expenditures, thus balancing environmental and economic benefits in the public interest."

Recent Foreign Acquisitions of U.S. Cement Companies

Parent company—Holderbank Financiere Glarus AG (Switzerland); Canadian subsidiary—St. Lawrence Co. (Montreal); U.S. subsidiary of St. Lawrence—Independent Cement Corp. (Keene, N.H.), established in 1977

Independent Cement acquisitions

- Hudson, N.Y.—purchased closed plant of U.S. Steel Corp.'s Universal Atlas Cement Div. in 1977
- Kingston, N.Y.—lease/purchase agreement for Colonial Sand & Stone Inc.'s plant in 1978

U.S. subsidiary of Holderbank: Dundee Cement Co. (Dundee, Mich.)

- Dundee, Mich.—onstream in 1960
- Clarksville, Mo.—onstream in 1967
- Holly Hill, S.C.—purchased Santee Portland Cement Corp. in 1978

Parent company—St. Marys Cement Co. (Toronto, Canada)

- Wyandotte, Mich.—acquired Wyandotte Cement Inc. in 1978

Parent company—Lake Ontario Cement Co. (Toronto, Canada); U.S. subsidiary—Aetna Cement Corp. (Essexville, Mich.)

- Essexville, Mich.—purchased Martin Marietta Corp.'s cement plant in 1977

Parent company—Portland-Zementwerke Heidelberg, A.G. (W. Germany); U.S. subsidiary—Lehigh Portland Cement Co. (headquartered in Allentown, Pa.), acquired in 1977

Parent company—Canada Cement Lafarge Ltd. (Canada); U.S. subsidiary—Citadel Cement Corp. Since 1974, Citadel had been a joint venture of Canada Cement Lafarge and Lone Star Industries, Inc. The joint venture was terminated in 1977

Plants operating under Citadel Cement:

- Demopolis, Ala.—new plant completed in 1977
- Birmingham, Ala.—existing plant

Parent company—Societe des Ciments Francais (France)

- Nazareth, Pa.—acquired Coplay Cement Manufacturing Co. in 1976

Parent company—Societe des Ciments Vicst (France)

- Ragland, Ala.—acquired National Cement Co., Inc. in 1974

Parent company—Genstar Limited (Montreal, Canada)

- The Flintkote Co.—acquired in 1979 (Flintkote's operations include four cement plants).

Fig. 7

Recent Mergers and Acquisitions: Domestic Companies

Amcord, Inc.—became wholly owned subsidiary of Gifford-Hill & Co., Inc., 1979. (Amcord: five cement plants; Gifford-Hill: two cement plants.)

Florida Mining & Materials Corp. (one cement plant)—acquired by Moore McCormack Resources Inc., 1979.

Marquette Cement Co.—acquired by Gulf & Western Industries, Inc., 1976.

Maule Industries, Inc.—acquired by Lone Star Industries, Inc., in 1978.

Medusa Corp.—acquired by Crane Co., 1978.

Portland Cement of Utah—acquired by Lone Star Industries, 1979.

SME Cement, Inc.—wholly owned subsidiary of Standard Machine & Equipment Co., Uniontown, Pa. Purchased former Diamond Portland Cement Co. plant in Middle Branch, Ohio, from Flintkote in 1978. Plant put into operation again in 1979.

Fig. 8

diameter Sturtevant separator; Fuller-Airmerge homogenizing system; electrostatic precipitator. Feasibility work was done by Lehigh and Bendy Engineering Co. Macdonald Engineering performed the design-engineering function and was the general contractor. A new Hammermills, Inc. Impact Master crusher was installed in the quarry.

- Alsen, N.Y.: Planning new 750,000-tpy plant.

- Union Bridge, Md.: Planning 500,000-tpy expansion.

Lone Star Industries, Inc. (Cement & Construction Materials Group)

- Santa Cruz, Calif.: Expansion and modernization, scheduled for late 1980 completion, will increase capacity from 395,000 tpy to 750,000 tpy. Equipment supplied includes: F. L. Smidth four-stage preheater-precalciner unit with 13 ft. x 184 ft. rotary kiln section; Folax grate clinker cooler; raw roller mill; homogenizing/kiln feed silos; new cement grinding mill; additional electrostatic precipitators; C-E Raymond bowl mill; 18 ft. diameter air separator. Engineering planning was carried out by Bendy Engineering Co. and SPCM, Inc.

- Georgetown, Tex.: New one-million tpy plant to be constructed on property owned by Texas Crushed Stone, Inc. No completion date given.

- Grantsville, Utah: Planning new 500,000-tpy plant.

Lone Star Lafarge Co.

- Norfolk, Va.: New high alumina cement plant went on stream in 1978.

Marquette Co.

- Cape Girardeau, Mo.: New \$80 million, 1.2-million-tpy dry process plant will replace existing 250,000 wet process plant at the same location. Kaiser Engineers is providing engineering, procurement, and construction services. Completion is scheduled for early 1981. Equipment supplied to include: Allis-Chalmers four-stage reinforced suspension preheater with a 14.5 ft. x 235 ft. rotary kiln section; Allis-Chalmers stoker-type grate clinker cooler; two Allis-Chalmers 13 ft. x 52 ft.,

4500-hp Compeb finish mills; C-E Raymond raw roller mill rated at 250 tph and driven by a 3000-hp motor; two Raymond 21 ft. diameter air separators for the finish mills; two C-E Raymond bowl-type coal mills; Envirotech-Buell electrostatic precipitator; baghouses; cyclone dust collectors. Instrumentation will be a combination of Eagle Signal, G & W Manufacturing Co. and Swanson Engineering Co. equipment and will incorporate an on-line computer system consisting of three CRT's with a complete plant display panel board.

Martin Marietta Corp.

- Buffalo, Iowa: New 850,000 \$80 million dry process, coal-fired plant is scheduled to go on stream in 1981. Equipment to be supplied includes: F. L. Smidth preheater/precalciner kiln with 14 ft. x 200 ft. rotary kiln section and a 924S Folax grate cooler; Allis-Chalmers multi-compartment rotary Compeb mill, 15 ft. x 53 ft., 7,000 hp; 230 tph roller mill, 1500 hp. Kaiser Engineers is providing engineering and design services.

- Utah: Lafarge Consultants Ltd. (Montreal) and Fuller Co. are conducting parallel preliminary studies for a proposed new dry process cement plant of 500,000 tpy capacity for state of Utah.

- Lyons, Colo.: Long-kiln, dry process plant conversion to flash calcining system via a \$6.8 million contract with Fuller Co. The 14 ft. 3 in. x 17 ft. x 490 ft. rotary kiln will be cut to 14 ft. 3 in. x 245 ft. A Fuller SF 135 suspension flash calciner with a modified Stage IV cyclone will be used to preheat and partially calcine the raw materials. The plant's existing direct coal-fired system will be converted to a semi-direct system to permit use of pulverized coal for both the kiln and the flash calciner. After the conversion, rated capacity will be 1,250 tpd. Kerogens in the shale portion of the raw materials will be burned off in the flash calciner. Start-up is scheduled for the first quarter of 1980.

Medusa Corp.

- Charlevoix, Mich.: Converting from wet to dry process in a \$50 million project scheduled for

completion in the spring of 1980. Kaiser Engineers have contract to provide engineering, procurement, and construction management services. Capacity will increase from the present 2,400 tpd to 4,400 tpd in the dry process. Equipment includes: Fuller SF-141 four-stage suspension preheater/flash calciner system; AAF-Elex electrostatic precipitator; Polysius 360-tph double-roller raw mill; C-E Raymond coal bowl mill; Fuller Airmerge blending system; gravel-bed clinker cooler; Foxboro SPEC 200 electric control. The existing 18 ft. 6 in. x 17 ft. x 18 ft. 6 in. x 580 ft. rotary kiln will be cut to 18 ft. 6 in. x 17 ft. x 350 ft. length.

Monolith Portland Cement Co.

- Laramie, Wyo.: Doubling capacity to one million tpy. Equipment ordered includes: F. L. Smidth 12 ft. x 13 ft. 6 in. x 450 ft. wet process rotary kiln rated at 900 tpd; Folax clinker cooler; Tirax coal mill.

National Cement Co., Inc.

- Ragland, Ala.: In 1978, completed Phase II of its expansion program to increase capacity from 360,000 to one million tpy. Second phase of the program included a distribution and storage system for limestone, shale, sand, and material storage silos. A Loesche coal mill and a Wheelabrator-Frye/Lurgi evaporative cooling tower were also installed. In the first phase of the program, a Fuller four-stage suspension preheater unit with a precalciner alkali bypass system was installed. The existing 500 ft. rotary kiln was shortened to about 300 ft. Most of the engineering work was handled by the Austin Co.

OKC Corp.

(Oklahoma Cement Co. Div.)

- Pryor, Okla.: A \$28 million expansion program to increase capacity 280,000 tpy was scheduled for 1979 start-up. Fuller Co. supplied most of the equipment, including: 12 ft. x 13 ft. 6 in. x 400 ft. rotary kiln; grate clinker cooler; 12 ft. x 26 ft. two-compartment ball mill; bag-type dust collectors. A C-E Raymond coal mill was also installed. This is a Kaiser Engineers project.



Suspension preheater kiln system was incorporated in Texas Cement's new 500,000 tpy Buda, Texas plant which went onstream in 1978.

Oregon Portland Cement Co.

- Durkee, Ore.: New 500,000-tpy, \$37-million dry-process plant placed on stream in 1979. F. L. Smidth supplied most of the equipment, including: four-stage cyclone preheater unit with rotary kiln section and Unax cooler; 2,100-hp Tirax Unidan drying and grinding mill; homogenization system; 4.35 x 66m gas conditioning tower and precipitator; Tirax coal mill; 4,000-hp Unidan 13 ft. x 47 ft. 3 in. finish mill; cement coolers; electrostatic precipitators.

Portland Cement Co. of Utah (Lone Star Industries, Inc.)

- Salt Lake City, Utah: Adding an Allis-Chalmers 11 ft. x 300 ft. kiln to replace two small kilns and increase plant capacity 30% to 420,000 tpy (wet process). Other new equipment includes a Fuller grate cooler and a Wheelabrator filter bag dust collector. Donald R. Warren Co. is the engineering consultant. Scheduled on stream in 1979.

Rinker Materials Corp.

- Miami, Fla.: Lafarge Consultants Ltd. (Montreal, Canada) has been awarded a contract to provide design and detail engineering services to convert two existing raw grinding mills to a closed-

circuit finish grinding facility. The project involves new feed bins, weighfeeders, mill discharge equipment, air separators, dust collectors, and a cement transport system to storage.

SME Cement, Inc.

- Middle Branch, Ohio: Former Diamond Portland Cement Co. plant, purchased in 1960 by Flintkote, was sold by Flintkote to Standard Machine and Equipment Co. in 1977. The plant was incorporated as SME Cement Inc. in 1978 as a wholly owned subsidiary of Standard Machine & Equipment. Two of the plant's kilns, all of which had been shut down, were again placed in operation in 1979, with an estimated capacity of 1,000 tpd.

S.D. Cement Commission

- Rapid City, S.D.: New 1,650-tpd, \$27.8 million suspension preheater plant on stream in 1978. Major equipment, supplied by the Fuller Co., included: 15 ft. x 220 ft. rotary kiln section with a four-stage suspension preheater; grate clinker cooler; LM-27 Loesche roller mill with auxiliary air heater; 13 ft. x 40 ft. finish mill with 22 ft. diameter separator; Airmerge blending, storage and kiln feed: dust collectors.

Southdown, Inc. (Southwestern Portland Cement Co.)

- Odessa, Tex. (Southwest Div.): Modernization program completed in 1978 added 250,000-tpy capacity to existing 290,000-tpy plant. Equipment supplied: Fuller four-stage preheater with 11 ft. 3 in. x 53 ft. rotary kiln section; clinker cooler; dust collectors; 15 ft. x 22 ft. 3 in. ball mill; Allis-Chalmers 13 ft. x 45 ft. Compeb diaphragm mill.

Texas Cement Co.

- Buda, Tex.: New 500,000-tpy, \$32 million dry process plant was placed on stream in 1978. Equipment supplied included: Fuller Traylor four-stage suspension preheater kiln system with 13 ft. 6 in. x 190 ft. rotary kiln section; Fuller-Loesche LM-243 raw roller mill; grate-type clinker cooling system; 12 ft. 6 in. x 39 ft. two-compartment finish mill; Airmerge blending system; cement cooler; baghouse dust collectors.

Texas Industries, Inc.

- Hunter, Tex.: New 550,000-tpy, \$50 million dry process plant scheduled to go on stream in late 1979. Equipment includes a Polysius precalcining AS system with a 3.8 x 56m rotary kiln section rated at 1,700 mtpd.

Aggregates, other major nonmetals

Progress of 1979 faces slowdown in 1980

BY SANDY HEROD
and
SID LEVINE

Our annual PIT & QUARRY survey of the aggregate industries involves the mailing of questionnaires to several thousand top management and operating men in the sand and gravel, crushed stone and lightweight aggregates industries.

To keep tab of year-to-year trends, information is requested on such factors as production levels, pricing, labor and maintenance costs. The tabulation and analysis of these data provide the framework for the review elements of this report.

The outlook for the coming year is studied in the light of informa-

tion submitted in answer to queries concerning the individual respondents' expectations for business in his area and his plans, if any, for new plants, replacement of old equipment and expansion projects.

An accompanying table summarizes the data derived from the tabulation of information submitted on those points. In view of the fact that the annual surveys are conducted early in the fourth quarter of the year, producers are asked to make full year estimates on certain factors.

The return from every individual respondent is kept strictly

confidential and none is individually identifiable in these reports. Information submitted is tabulated on a regional basis; those data then are recapitulated to arrive at the weighted national averages shown in the summary.

Total production figures arrived at from our PIT & QUARRY survey will display variance with those presented by national industry associations; this is because we survey only aggregate producers. Figures submitted by national associations on the tonnage of crushed stone, sand and gravel, etc., include such uses as cement and lime manufacture, metallurgy, foundries, glass manufacture and other major industrial markets.

• A year ago, we offered the opinion that aggregate production in 1978 maintained the upward trend that had been reinitiated three years previously. That position has been verified by both the government's commodity reports and data received in our own survey.

According to the Mineral Industry Survey reports for 1978, prepared by the Division of Non-metallic Minerals of the Bureau of Mines, the combined production of sand and gravel, crushed stone and slag amounted to 1.8 billion tons; about 13.9 million tons of lightweight aggregates were produced.

Based on the information supplied by respondents to our latest survey, it appears that two of the standard weight aggregate categories, (sand and gravel and crushed stone) recorded an increase during 1979 while slag output remained at about the level of the previous year. Combined volume shows an apparent gain of about 3%.

• Our projection of survey data leads to an estimated production of sand and gravel in 1979 at the 1 billion ton level, an increase in output of crushed stone to nearly 860 million tons (aggregates and similar products only), an apparent processing rate of 35 million tons for slag (other than lightweight expanded material), and a combined output of all lightweight aggregates reaching 14 million tons.

The number of respondents to our 1979 survey indicating an anticipated increase in business during 1980 dropped from the

Summary of Pit & Quarry's 1979 Aggregate Survey

	Sand & Gravel	Crushed Stone	Lightweight Aggregate
Review of 1979			
Production (+ or -)	+ 7%	+ 3%	+ 1%
Pricing of product			
raised (% of replies)	84	82	91
Avg. % raised (weighted)	+11	+10	+ 9
Wages			
raised (% of replies)	90	85	85
Avg. % raised (weighted)	+ 9	+10	+10
Maintenance costs			
up (% of replies)	90	88	86
avg. % of increase (weighted)	+17	+18	+16
Outlook for 1980			
Gain expected (% of replies)	38	33	36
Avg. (weighted) gain expected	+14	+16	+21
Drop expected (% of replies)	9	21	32
Avg. (weighted) drop expected	-13	-16	-18
No change expected (% of replies)	37	34	32
Unclear (% of replies)	8	4	0
Plans reported (% of replies)			
New plants	7	9	14
Plant expansion	16	16	18
Equipment replacement	27	30	50

This table summarizes various major factors reviewed in Pit & Quarry's annual survey of aggregate producers excepting slag which is discussed in an accompanying association commentary. As applicable, the figures indicate percent of change.

number who, last year, expressed that opinion for 1979 business.

However, the percentage of optimists within each category of aggregate producers was close. The same holds true for the percentages of respondents who felt that the coming year would be at least as favorable as the past one.

Along with the review and forecast data on sand and gravel, crushed stone and lightweight aggregates, this report reviews the latest statistics available (1978) on other major nonmetallic industries including lime, gypsum, agricultural limestone, phosphate rock, potash, barite, talc, feldspar and fluorspar.

Lime production for 1979 is expected to show a one percent gain over 1978. The leading uses for lime in 1978 were in steel furnaces, alkalies, water treatment, and pulp and paper. Gypsum mined in the United States set a new annual record in 1979 because of the continuing building activity.

Marketable phosphate rock production showed a 6% gain in 1978, with similar annual growth indicated for 1979 and 1980. The principal domestic markets were fertilizers and animal feed supplements, and industrial and food grade products. Domestic potash production, up 2% in 1978, shows indication of increases in annual growth rate for 1979 and 1980. About 95% of the total potash output is used directly in the fertilizer industry.

Drilling muds continue as the main end-use for barite, which reached a record output in 1978. An annual growth rate of 3% is indicated for 1979 and 1980. Feldspar and talc showed slight gains in production in 1978, and crude fluorspar output decreased.

Sand and gravel

Information submitted by respondents to our recently completed survey of the industry indicates that this industry experienced continued growth during 1978; the Bureau of Mines Mineral Industry Report for that year substantiates the gain which amounted to 7%. Total tonnage was about 963 million, valued at \$2 billion (construction aggregates only).

A further increase was recorded during the past year, our survey indicates, with estimated production for all of 1979 nearly reaching the 1 billion ton level—another 7% gain.

The numbers of respondents in our 1979 survey who are optimistic about the coming year dropped about one-third from those of that persuasion a year ago.

Since production levels alone do not show the complete picture of the condition of the industries, our survey seeks information on such basics as trends in pricing, labor cost, maintenance factors and tons/manhour.

- With respect to the cost of labor, it would only be surprising if the upward trend had been arrested; and it has not been. However, the weighted national average of 9% higher wage levels, reported by 90% of our respondents, compares favorably with the 14% increase reported for 1978. Unfortunately, there was no measurable change in productivity to match the increase in labor cost. Regionally, the western and north central regions of the country lead the rest with the highest wage scales.

- The sharp increases in maintenance costs, indicated in preceding surveys, continue to hobble producers. With 90% of our 1979 respondents reporting increases that average out nationally (weighted) at 17%, there exists an almost exact duplication of their situation a year ago. Along with the higher cost of maintenance labor, parts availability, particularly with respect to wear metal components, was far and away the most troublesome for the industry's operators.

- Prices were raised last year by 84% of our respondents (3% more than in 1978), and the weighted national average increase of 11% was virtually the same as reported for 1978. With consistently substantial annual increases in at least two major costs of operating, the return from higher prices is appreciably minimized.

Outlook

A lesser number of respondents (39%) look for further improve-

ment in business in 1980 than was the case a year ago with respect to 1979. However, the weighted average gain expected (14%) is about the same as proposed a year ago. Further, another 37% of our replies indicate the feeling that the coming year will be on a par with the past one. Only 9% of the survey questionnaires note an expected decrease in business volume.

In view of the existing and potential economic factors in our economy that have an impact on construction, we feel that, despite the industry's capability, it will not be called upon to deliver at the rate of last year. It is estimated that production will drop back toward the 1978 level of about 960 million tons.

Crushed stone

In reporting last year on our survey of this industry for 1978, we pointed to a probable increase of about 6% in production volume over the preceding year. As it turned out, according to final Bureau of Mines statistics, the increase was nearly twice that and production of nearly 835 million tons, valued at \$2.1 billion, was recorded.

According to our latest survey, an increase of 3% was realized during 1979 which would result in a volume of 859 million tons last year.

About one-third fewer of our respondents reported optimism for 1980 than was found with respect to 1979 a year ago. However, an almost identical number (34%) expressed the opinion that the coming year will be as active as the last.

Even on a weighted basis, as seen in the accompanying table, the national average of expected increases reported appears overly optimistic. As indicated at the conclusion of this discussion, the average has been tempered through consideration of interest rates, inflation and other factors that influence construction.

- Our tabulation of survey returns by region indicates that all registered an increase in production during 1979, the highest rate being found in the West. The weighted national average of all regions was 7%, just 1% above

that recorded in the 1978 survey. Interestingly, no measurable change in the tons/manhour factor could be found in the analysis of returns.

- No surprises are found in the data submitted on labor costs—costs continued to rise, with the weighted national average being an increase of 10%. This is based on returns of 95% of our respondents to the crushed stone survey, and is two percentage points above the increase reported for the preceding year.

- The cost of keeping equipment—mobile and stationary—in operation becomes steadily higher. Nationally, the industry's producers experienced a climb of 18% in this troublesome cost center. Individually, none of the regions varied more than a couple of percentage points from that average which was 4% higher than reported for 1978.

While there were scattered references in this survey to specific types of equipment such as drills, loaders, screens, etc., as major problems in the maintenance area, by far the most common problems and complaints cited were parts availability and service, wear metal (primarily crusher components) and incompetent maintenance labor.

- Far from offsetting the increases in operating costs noted above, the industry-wide increase reported in pricing was required to achieve even a minimal profit. The weighted national average increase, based on responses in 82% of survey returns, was on the order of 10%—just 2% over that posted in 1978.

Outlook

It was noted earlier that some two-thirds of our respondents were optimistic concerning 1980 either to the extent of outright prediction of an increase in business or expressed anticipation of market demand at least equal to that in 1979. They were divided nearly 50/50 between the two viewpoints.

However, 21% of all who furnished information for this survey indicated they look for a drop in 1980. This is three times as many as those who held that opinion a year ago with respect to 1979's

potential. They look for a 16% decline (weighted average), the same rate of change that the most optimistic propose as a gain.

Considering the current and potential levels of money rates, and the long-term impact of inflation levels, it cannot be realistically proposed here that the industry will record further gains this year. No precipitate decline is expected, but rather a decrease on the order of 3-4%, which would result in a 1980 output of about 833 million tons—approximately equal to the 1978 level.

Lightweight aggregates

Respondents to our 1978 survey of lightweight aggregate producers—both natural and manufactured types—supplied preliminary figures for the full year that indicated production increase of nearly 13% over the preceding year.

According to final government figures on these materials for that year, there was a gain of 10% in the combined output of expanded clay, shale and slate, pumice, expanded slag, expanded perlite and exfoliated vermiculite. The total was about 13.9 million tons.

Our 1979 survey returns reflect a considerably more modest rate of climb during 1979 (combined basis) to an estimated level of 14 million tons.

Despite the fact that the majority of producers of lightweight aggregates find themselves in a seller's market of high demand, most of them who employ pyro-processing in production systems face severe problems with respect to fuels and air quality regulations. In the face of these concerns, it is not surprising that they are unable to realize full market potential, and gained only an estimated 1% last year.

- While, as a group, the various lightweight aggregates were produced at a minimally higher rate last year, the increases in major cost centers paralleled those experienced by producers of standard weight aggregates.

Labor costs, as indicated in 95% of the survey returns, rose by 10% as compared with 9% for the preceding year; and 86% of our respondents noted further in-

creases in maintenance expenditures, with the national average determined to be 16%.

- While prices were raised last year at a national average of 9%, the extent of that raise still was below those of both labor and maintenance costs.

Outlook

The number of plants producing lightweight aggregates with pyro-processing has declined. Those producers who thus far have been able to surmount the difficulties of fuel availability and the high cost of EPA-mandated pollution control equipment have generally geared up to meet market demand as well as they can, and, as indicated in the table, about one-third anticipate a substantial increase in business for 1980.

However, another third predict a decline while the remainder feel that there will be no change from 1979. In consideration of the industry's built-in problems, along with the projected decrease in building construction, it is expected that lightweight aggregate production will decline during the coming year to a level of about 13.6 million tons.

Lime

Total U.S. lime production for 1979 will probably show a 1% increase over the 20.484 million short tons sold or used by producers in 1978. The projected slowdown in the economy is expected to lower lime output by about 5% in 1980. The record for lime output was 21.645 million short tons, set in 1974.

There were 165 lime plants in the United States in 1978, compared with 161 in 1977 and 163 in 1976. Leading producing states in 1978 were Ohio, Pennsylvania, Missouri, Texas, and Michigan, accounting for 50% of the total output. Ten companies, operating 30 plants, accounted for 43% of the total production. Captive lime used by producers in 1978 amounted to about 26% of total production.

The total value of lime sold or used by U.S. producers was \$743 million, a 12% increase over the previous year. The average price per ton at the plant has risen from

\$13.39 in 1968 to \$36.76 in 1978.

The leading individual uses for lime in 1978 were in steel furnaces, alkalies, water treatment, and pulp and paper. For commercial (open-market) lime, sales for chemical and industrial uses were 88%; for construction (including road stabilization), 7%; refractories (dead-burned dolomite), 5%. Captive lime used by producers accounted for about 25% of the total lime production.

Average production percentages by type for the five-year period from 1973 to 1977 were: quicklime, 82.5%; hydrated lime, 12.2%; dead-burned dolomite, 5.3%. Imports in 1978 amounted to 610,000 short tons, and exports totaled 45,000 tons.

Although aglime production for both the calcined product and agricultural limestone has decreased in the past two years, an increase of several percent is anticipated for 1980. Total sales of lime for agriculture in 1978 amounted to 71,884 tons, down 9% from 1977. Total sales of agricultural limestone in 1978 was 30.697 million tons, a 2% decrease from 1977. The estimated production decrease for 1979 is between 4-6% for aglime.

Gypsum

In 1978, producers at 69 mines and quarries in 22 states mined 14.891 million short tons of crude gypsum. This was an 11% increase over 1977, and a new all-time annual record. Imports of gypsum rock for consumption totaled 8.308 million tons, and by-product gypsum provided an additional 669,000 tons of crude gypsum. Buildup of crude gypsum inventory and indications of a dip in building could lead to a 5% drop in gypsum supply in 1979 and in 1980.

In order of total output, the leading individual mines in 1978 were: U.S. Gypsum's Alabaster mine in Iosco County, Mich.; U.S. Gypsum's Plaster City mine in Imperial County, Calif.; National Gypsum's Tawas mine in Iosco County, Mich.; U.S. Gypsum's Southard mine in Blaine County, Okla.; National Gypsum's Shoals mine in Martin County, Ind.; U.S. Gypsum's Shoals mine in Martin County, Ind.; Pacific Coast Build-

ing Products' Las Vegas mine in Clark County, Nev.; U.S. Gypsum's Sweetwater mine in Nolan County, Tex.; Georgia-Pacific's Acme mine in Hardeman County, Tex.; Weyerhaeuser's Briar mine in Howard County, Ark. These mines accounted for 47% of the total.

Calcined gypsum production in the U.S. amounted to 14.041 million short tons in 1978. Gypsum was calcined at 71 plants in 29 states. In order of total output, the leading individual plants in 1978 were: U.S. Gypsum's Plaster City plant, Imperial County, Calif.; U.S. Gypsum's Stony Point plant, Rockland County, N.Y.; U.S. Gypsum's Detroit plant, Wayne County, Mich.; Weyerhaeuser's Briar plant, Howard County, Ark.; U.S. Gypsum's Shoals plant, Martin County, Ind.; U.S. Gypsum's Southard plant, Blaine County, Okla.; Georgia-Pacific's Acme plant, Hardeman County, Tex.; Pacific Coast Building Products' Apex plant, Clark County, Nev.; U.S. Gypsum's Duval plant, Duval County, Fla.; U.S. Gypsum's Sweetwater plant, Nolan County, Tex. These 10 plants accounted for 29% of the total.

Of the 5.881 million tons of uncalcined gypsum sold or used in the U.S. in 1978, portland cement accounted for 71.6%; agriculture for 25.6%; fillers and miscellaneous uses, 2.8%. Production of calcined gypsum amounted to 14.041 million tons in 1978, and production of gypsum products made from calcined domestic, imported, and by-product gypsum totaled 15.708 million tons.

Prefabricated products accounted for 94.2% of total calcined products; industrial plaster, 2.5%; building plaster, 3.3%. Prefabricated products production amounted to 16.445 million "thousand square feet" units of lath, veneer base, sheathing, regular gypsum board, Type X gypsum board, predecorated wallboard, and other products.

Total values for the 1978 production and sales were: crude gypsum mined, \$92.726 million; calcined gypsum produced, \$387.010 million; gypsum products sold, \$1.248 billion; imports for consumption of gypsum and

gypsum products, \$63.882 million; exports of gypsum and gypsum products, \$19.804 million. Average values of crude gypsum per ton (FOB mine) have risen from \$3.67 in 1968 to \$6.23 in 1978.

Phosphate rock

Mine production of phosphate rock in the United States in 1978 amounted to 173.429 million metric tons, and marketable production totaled 50.037 million metric tons, a 6% gain over 1977. Apparent consumption (measured by amount sold or used plus imports minus exports) amounted to 37.112 million metric tons. Production will probably continue at the same annual rate through 1979 and 1980.

Marketable phosphate rock was produced by 23 companies in 1978. Ten of the companies produced 79% of the total U.S. production from mines in Florida. The percent production distribution pattern by state was: Florida and North Carolina, 86%; Idaho, Montana, Utah and Wyoming, 10%; and Tennessee, 4%. Exports amounted to 12.570 million metric tons, and imports for consumption totaled 908,000 metric tons.

The principal domestic markets for phosphate rock in 1978 were: fertilizers and animal feed supplements, 88%; industrial and food grade products, 12%. Uses of 36.204 million metric tons of phosphate rock sold or used domestically by producers in the U.S. were: wet-process phosphoric acid, 81.0%; normal superphosphate, 0.8%; triple superphosphate, 4.9%; defluorinated rock, 0.5%; direct applications, 0.1%; elemental phosphorus, 12.1%; ferrophosphorus, 0.6%.

The total value of marketable phosphate rock produced in the U.S. in 1978 was \$928.82 million. The average unit price was \$18.56 per metric ton (FOB plant) in 1978, as compared with the \$21.26 and \$17.39 per metric ton reported in 1976 and 1977, respectively. The value of exports increased from \$21.81 per metric ton in 1977 to \$23.08 per metric ton in 1978, FOB plant. Imports, principally from Morocco, increased to 908,000 metric tons at an average value of \$26.85 per

metric ton (customs import value).

Potash

Potash production in the U.S. in 1978 amounted to 4.326 million metric tons (2.253 million metric tons K_2O equivalent). Imports for consumption totaled 7.762 million metric tons (4.705 million m.t. K_2O equivalent), and exports amounted to 1.431 million m.t. (0.809 million m.t. K_2O equivalent).

Apparent consumption was 10.689 million m.t. (6.203 million m.t. K_2O equivalent). The 1979 and 1980 production may show a 4% annual increase above the 1978 apparent consumption data. The value of potash sales by producers was \$226.5 million in 1978; exports were valued at \$88.6 million; and the customs value of imports of potash for consumption totaled \$399.2 million. The average value of potash sold by producers has increased from \$24.58 per m.t. in 1971 to \$51.97 per m.t. in 1978.

Potash production was centered in eastern New Mexico in 1978, where seven companies operating eight mines by conventional mining of bedded deposits produced 85% of the U.S. total. One mine in Utah recovered potash by dissolving it in water underground and pumping it to the surface for recovery. Two plants in Utah and one in California recovered potash from salt lakes or natural brines. Ten companies comprise the domestic industry. Most potash is produced as potassium chloride (potassium muriate). About 95% of the total output is used directly in the fertilizer industry.

Barite

U.S. mine production of barite ($BaSO_4$) sold or used rose to a record 2.112 million short tons in 1978. Imports of crude barite increased to a record high of 1.291 million short tons, and exports amounted to 37,000 tons. Crushed and ground barite sold or used by producers in 1978 amounted to 2.702 million short tons, and barium chemicals sold or used by producers amounted to 55,000 short tons. The average annual growth rate for crude

barite may be expected to increase about 3% for 1979 and 1980.

Nevada is still the leading producing state with 85% of the total production in 1978. Other producing states in descending order of production were Missouri, Arkansas, Georgia, Montana, Idaho, Tennessee, and Illinois. Crushed and ground barite was sold by 38 plants in 1978, and barium chemicals were produced and sold by six plants in the U.S.

Drilling muds for the oil and gas industry continued as the dominant end use, accounting for 92% of total sales. Other uses for barite include applications in paints, glass and rubber, as well as the production of barium chemicals.

The total value of primary (crude) barite sold or used by producers in the U.S. in 1978 amounted to \$43.980 million. Imports were valued at \$40.525 million; exports at \$2.341 million; crushed and ground barite at \$123.433 million; and barium chemicals at \$23.772 million.

Feldspar

Feldspar production totaled 735,000 short tons, valued at \$18.2 million in 1978. Feldspar was mined in 10 states, with North Carolina in the lead, followed by Connecticut and Georgia. The other producing states, in descending order, were California, Oklahoma, South Dakota, Arizona, Wyoming, Colorado, and Maine.

Imports for consumption in 1978 amounted to 39 short tons. Exports amounted to 10,331 tons, valued at \$853,000. The 1978 end-use distribution of domestic feldspar was: glass, 60%; ceramics (pottery), 30%; coating and plating (porcelain enamel) and miscellaneous applications, 10%. Production in 1979 and 1980 will probably be equivalent to the 1978 quantity.

Fluorspar

Mine production of crude fluorspar in 1978 amounted to 447,876 short tons, and shipments of finished fluorspar from domestic mining operations totaled 129,428 short tons valued at \$13.261 million FOB mine. Al-

most 90% of the total U.S. shipments came from Illinois. Mine production was reported by three producing firms operating eight mines in Illinois and one mine each in Arizona, Nevada, and Texas.

Imports for consumption amounted to 916,705 tons valued at \$67.6 million. Exports amounted to 8,287 tons with a value of \$978,000. Major industrial demand for fluorspar comprised: steel production, 50%; fluorocarbons and miscellaneous fluorine compounds, 20%; primary aluminum, 16%; others, 14%. A one percent increase in demand is anticipated through 1985.

Talc

Mine production of crude talc in the U.S. in 1978 amounted to 1.268 million short tons valued at \$14.956 million. Crude pyrophyllite mined totaled 116,000 tons valued at \$811,000. Talc sold or used by producers amounted to 1.155 million tons (valued at \$68.781 million), and pyrophyllite sold or used amounted to 116,000 tons (valued at \$2.804 million).

Talc, including soapstone, was produced at 38 mines in 12 states in 1978. The states producing the highest tonnage, in decreasing order, were Montana, Vermont, Texas, and New York. California, with 13 mines, has the largest number for any state. The pyrophyllite-producing mines in the U.S. in 1978 were all in North Carolina. Four companies operated six mines during the year.

Talc was consumed domestically in 1978 for the following applications: ceramics, 32%; paints, 22%; plastics, 13%; cosmetics, 8%; paper, 7%; rubber, 6%; insecticides, 3%; roofing, 3%; minor uses, 6%. Pyrophyllite consumption was mainly in refractories (52%), insecticides (25%), and ceramics (17%).

Imports for consumption in 1978 amounted to 19,000 tons, valued at \$1.944 million; and exports totaled 267,000 tons, valued at \$12.359 million. From a 1977 base, domestic demand for talc and related minerals is expected to increase at an average annual rate of about 4% through 1985. ●

The international cement scene

Plant and production update: 1980

BY SID LEVINE

World cement production for 1979 is expected to show an increase of 5% above the 1978 record of 840.6 million metric tons. In 1980, the world cement market is expected to rise about 4-5% with the largest increases (8-10%) taking place in Asia and Africa.

Asia's production was 28% (235.4 million metric tons) of the world total in 1978. Western Europe accounted for 25.51% (214.4 mmt); Eastern Europe (including the U.S.S.R.), 24.98% (210.0 mmt); the Americas, 17.61% (148.1 mmt); Africa, 3.18% (26.7 mmt); Australia and the rest of the world, 0.72% (6.0 mmt).

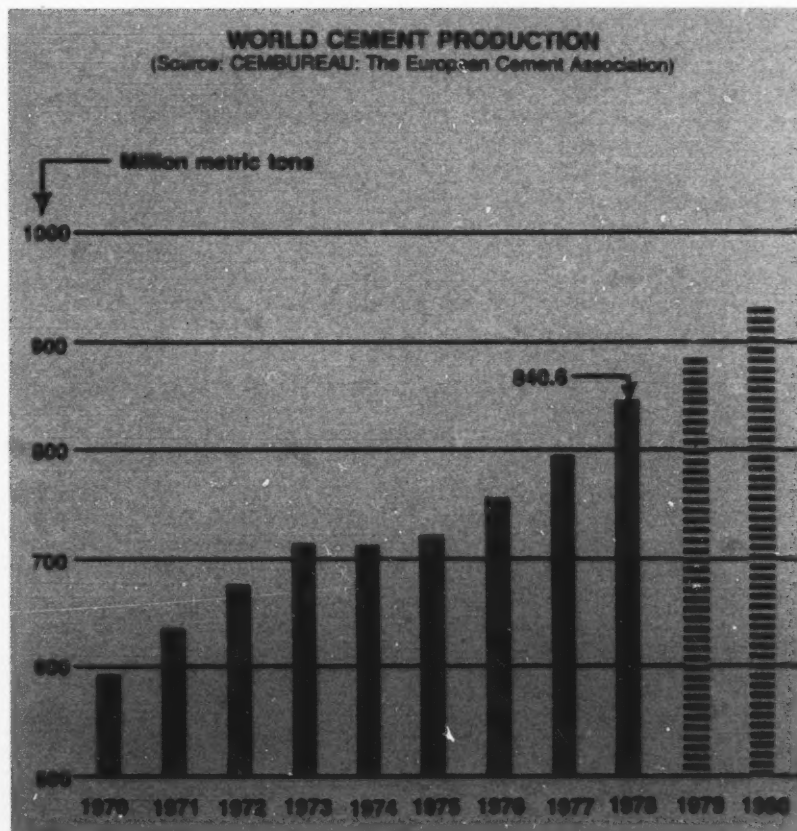
The twelve leading cement-producing countries in 1978 were: U.S.S.R., 129.3 million metric tons; Japan, 84.4 mmt; U.S.A., 71.6 mmt; China, 54 mmt; Italy, 38.5 mmt; Germany, 33 mmt; Spain, 32.1 mmt; France, 30.3 mmt; Brazil, 22.5 mmt; Poland, 21.7 mmt; India, 19.6 mmt; United Kingdom, 16.6 mmt.

Latin America's current construction boom may lead to a cement shortage in several of the countries. Mexico may introduce a program to increase cement production capacity by 30% every three years. Argentina, while currently self-sufficient in cement capacity, has an extensive construction program planned. Chile is said to expect an 8 to 10% construction growth rate. Cement consumption only rose about 1% in the Cembureau* cement market. The Cembureau predicts that its total cement market will remain practically unchanged in 1979 and 1980.

Small scale production via mini cement plants again are beginning to attract interest. This approach is said to be based on socio-economic considerations rather than on the advantages of large-scale plants. A mini plant is defined as one with a capacity of 100,000 mtpy or less.

In this annual survey, PIT & QUARRY provides projected operational dates for new cement plants and plant extensions, and lists projects that went into operation in 1978 and 1979. Where data were available, cement production quantities or estimated capacities are given for the 1975-1979 period for the various countries.

*Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, and United Kingdom.



Source Photo of Kiln Firing Segment Courtesy of Canada Cement La Farge Ltd.

AFRICA

Algeria

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.955	1.321	1.620	6.5	7.5

• Ain el Kebira (25 km. north of Setif). Capacity: 1 million mtpy. Onstream: 1978. Dry process (preheater-kiln arrangement); process computer. Major equipment suppliers: Humboldt Wedag and Hochtief AG. Consulting engineers: Technip and Lafarge Conseils et Etudes. SNMC (Societe Nationale des Materiaux de Construction) contract.

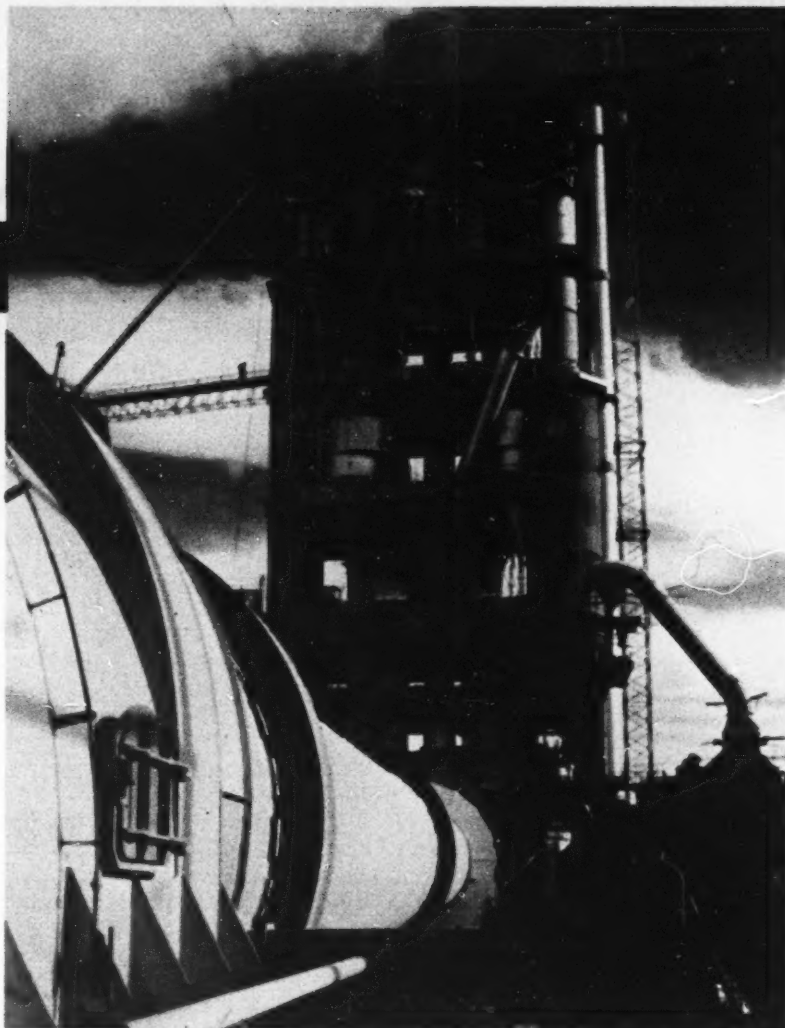
• Saïda. Capacity: 500,000 mtpy. Onstream: 1978. Dry process (preheater-kiln). Major equipment supplier: Kawasaki Heavy Industries, Ltd. Consulting engineers: Lafarge Conseils et Etudes. SNMC contract award.

• El Asnam (250 km. from Algiers). Capacity: 1 million mtpy. Onstream: 1979. Dry process, suspension preheater, computer controlled. Major equipment suppliers: Kawasaki Heavy Industries, Ltd. and Marubeni Corp. SNMC contract.

• Zahana (35 km southeast of Oran). Adding new dry process production line with 1 million mtpy capacity. Fives-Cail Babcock supplying major equipment, including: 5.6×84 m rotary kiln, associated with a four-stage preheater; 5.2×12.75 m raw mill, 300 tph, 5,000 kw motor; 4.8×15.25 m finish mill, 4,900 kw motor. Electrical equipment: Brown Boveri. Process control equipment: Comsip (France). SNMC contract. Consulting engineers: Prospective Engineering Gestion. Scheduled onstream: 1978.

• Beni-Saf. Capacity: 1 million mtpy. Major equipment supplier: Creusot-Loire Enterprises. Dry

Quantities in million metric tons



ALGERIA: Societe Nationale des Materiaux de Construction. Added new 1 million mtpy production line at Zahana (Courtesy: Prospective Engineering Gestion)

process plant with 1,200 tph crusher; 270 tph raw mill; two 90 tph finish mills; 18 ft.×300 ft. rotary kiln. SNMC contract. Process control equipment: Comsip (France). Consulting engineers: Prospective Engineering Gestion. Scheduled onstream: 1979.

• Constantine. Capacity: 1 million mtpy. Major equipment supplier: Creusot-Loire Enterprises. Similar to Beni-Saf project. SNMC contract.

• Tebasse area (800 km east of Algiers). SNMC awarded Kawasaki Heavy Industries and the Marubeni Corp. contract in 1979 for new cement plant.

Angola

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.400	0.150	0.200	0.900	0.900

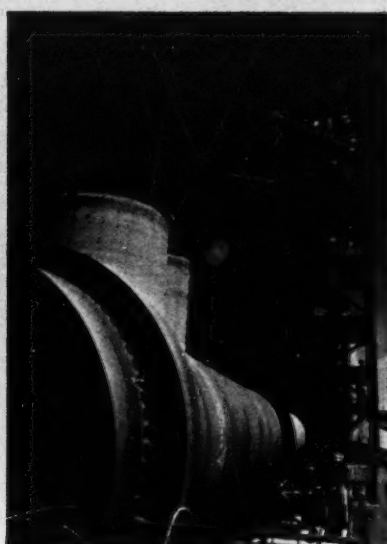
Benin

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.170	0.175	0.180	—	0.45

• Two neighboring West African states, the People's Republic of Benin and the Federal Republic of Nigeria, have jointly awarded F. L. Smidth & Co. A/S a contract for the construction of a cement plant with a capacity of 500,000 tpy. The new plant, which is to be built in the Republic of Benin, will be owned by a limited company, Societe des Ciments d'Onigbolo (SCO), in which Benin and Nigeria will be represented by 49% and 41%, respectively, of the share capital. The remaining 10% will be subscribed by F. L. Smidth. In addition to supplies for the facility, Smidth will place at SCO's disposal the necessary



LIBYA: Libyan Cement Co.—Control panel at new 1 million mtpy dry process plant at Hawari. (Courtesy: Prospective Engineering Gestion)



ALGERIA: Societe Nationale des Matériaux de Construction. Ain el Kebira plant (near Setif) is rated at 1 million mtpy (Courtesy: Humboldt Wedag)

key personnel for daily operation and also will be in charge of training local labor who eventually will take over the plant's operation.

The dry process plant will include a Tirax raw mill, 4.6m × 8.25m, with a 4.4m drying chamber, a 1,600 tpd oil-fired four-stage preheater Unax kiln, 4.55 × 68m, and a Unidan cement mill, 3.8m × 12m. The project currently is under construction, with completion expected in 1982.

• Cotonou: 200,000 mtpy open-circuit grinding plant scheduled onstream in 1978 by the Societe Nationale de Ciment (SONACI). Consulting engineers: Prospective Engineering Gestion. Main equipment supplier: Koch (Germany).

Cameroon

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.251	0.303	0.405	0.06	0.06

Central African Empire

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.019	0.017	0.016	0.12	0.12

• Fatima (near Bangui). Projected 120,000 tpy plant.

Congo Republic

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.055	0.049	0.066	0.06	0.06

Egypt, Arab Republic of

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
3.588	3.362	3.167	4.3	5.9

• Tourah Portland Cement Co.: Lecaie (Tourah). Adding 2,000 mtpd F. L. Smidth dry-process kiln equipped with cyclone preheater and a precalciner. Scheduled onstream: 1979.

• National Company for the Production of Cement: El-Tabbin (30 km south of Cairo). Adding 4,500 tpd production line. Major equipment suppliers are Humboldt Wedag and CGEE Alstom S.A. Clinker will be produced in a 76m long × 5m diam. rotary kiln with a twin-type preheater and an additional in-line firing arrangement. Scheduled onstream: 1979. Dyckerhoff Zementwerke will supply consulting services.

• Alexandria Portland Cement Co. (Alexandria). Expansion, due on-stream in 1979.

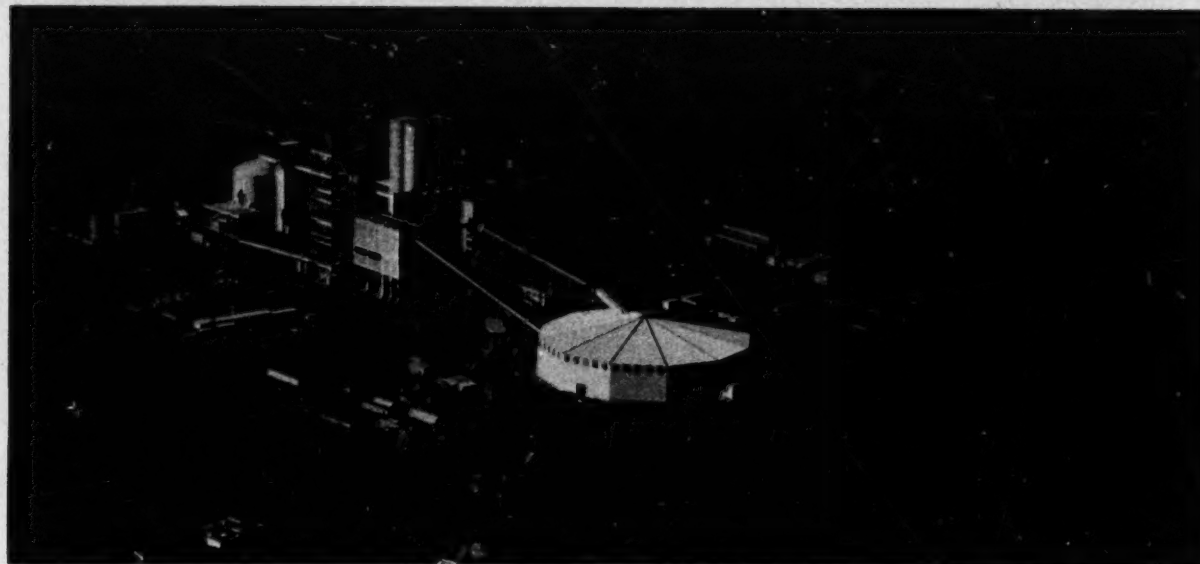
• Suez Cement Co., Eastern Plant, south of Suez City: Building new 1 million mtpy plant. Fuller Co. supplying equipment, including 15 ft. × 42 ft. raw mill; SF-141 preheater with flash calciner; 15 ft. × 16 ft. × 240 ft. rotary kiln; two 15 ft. × 46 ft. finish mills; grate clinker cooler; blending and raw storage silos; Fuller-Kinyon systems; dust collectors; fluidizing gravity conveying systems. Ferguson International Co. is project manager and consultant. Participating are: Arab Consulting Engineers; Arab Swiss Engineering Co.; Coopers & Lybrand (Management Systems); Bendy Engineering Co. (Process

Review); Morrison-Knudsen (Quarry Plan & Development); H. K. Ferguson, San Francisco Division (Coordination of U.S. Subcontractors, Purchasing, Expediting, Construction Estimate, and Portion of Engineering). Scheduled onstream: 1981.

• Suez Cement Co.: Second plant to be built in Quattamia (formerly East Maadi). Capacity: 1.4 million mtpy. Engineering and economic feasibility study by H. K. Ferguson Co., San Francisco Division.

• Helwan Portland Cement Co. (Helwan): Consortium formed by F. L. Smidth & Co. (Denmark) and Brown, Boveri & Co. (Switzerland) awarded contract by company to convert two existing wet process production lines to dry process. Both lines will incorporate F. L. Smidth precalcining systems with four-stage preheater kilns. Capacity: 3 million mtpy. Scheduled onstream: 1981.

• Helwan Portland Cement Corp. (Assiut). A 1.5 million mtpy plant is being built by a European consortium headed by Polysius. Equipment will include: four-stage Dopol heat exchanger; Prepol AS precalciner; rotary kiln; two raw-mix grinding mills with a capacity of 210 mtp each; one cement-grinding mill, 120 mtp; two cement-grinding mills, each rated at 83 mtp; raw materials handling and dressing plant; mixing beds for limestone and



MOROCCO: Asment de Temara. Rated at 500,000 mtpy, preheater equipped plant at Rabat went onstream in 1979. (Courtesy: Fuller Co.)

clay; raw mix homogenizing plant; clinker handling system; Polab II laboratory automation. Electrical equipment supplier: Brown Boveri. Bulk loading and bagging plant: Haver & Boecker. Consultants: Arab Swiss Engineering Co. Scheduled onstream: 1982.

Ethiopia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.117	0.126	0.113	—	—

Gabon

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.090	0.107	0.190	—	0.3

• N'toum (25 miles from Libreville). Societe des Ciments du Gabon. Capacity: 350,000 mtpy. Wet process using 460 ft.-long rotary kiln. Contract awarded to Creusot-Loire Entreprises and Lafarge Conseils & Etudes. Start-up scheduled for 1979.

• Franceville. Societe des Ciments du Gabon. Clinker-grinding plant. Capacity: 100,000 mtpy. Contract awarded to Creusot-Loire Entreprises and Lafarge Conseils & Etudes (France). Start-up scheduled for 1979.

Ghana (see also West Africa)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.666	0.679	0.565	0.9	1.3

• Tema. Ghana Cement Works Ltd. Expansion to double plant capacity to 800,000 tpy. Due onstream in 1979.

Guinea, Republic of

• Conakry. Contract awarded to Lafarge Conseils et Etudes for supervision of construction of clinker grinding plant in Conakry. Capacity: 250,000 mtpy. Start-up scheduled for 1980. The project is sponsored by the Government of the Republic of Guinea, represented by the Estate Committee for Cooperation with the Countries of the Arab League (Ministry of Planning and Cooperation).

• Three cement plant projects with a capacity of about 200,000 tpy are under consideration. Possible locations: Kindia (100 km east of Conakry); Lebekere (near the town of Mali on the Senegal border); Siguiri (on the Niger River near the Mali border).

Ivory Coast

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.710	0.800	0.961	—	—

• Clinker grinding plants only.

Kenya

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.897	0.987	1.137	1.5	1.5

• East African Portland Cement Co.—Athi River Works. Up-rating of the cement works from 265,000 mtpy to 450,000 mtpy of pozzolanic cement. Additional slurry milling and cement milling capacity being installed. Consultants: Blue Circle Technical group.

Liberia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.090	0.105	0.110	—	—

• Liberia Cement Corp.: Monrovia. 9.5 ft. × 15 ft. finish grinding ball mill, 700 hp. Furnished by Allis-Chalmers. Onstream in 1978.

Libya (Libyan Arab Republic)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.500	0.664	1.000	3.9	4.4

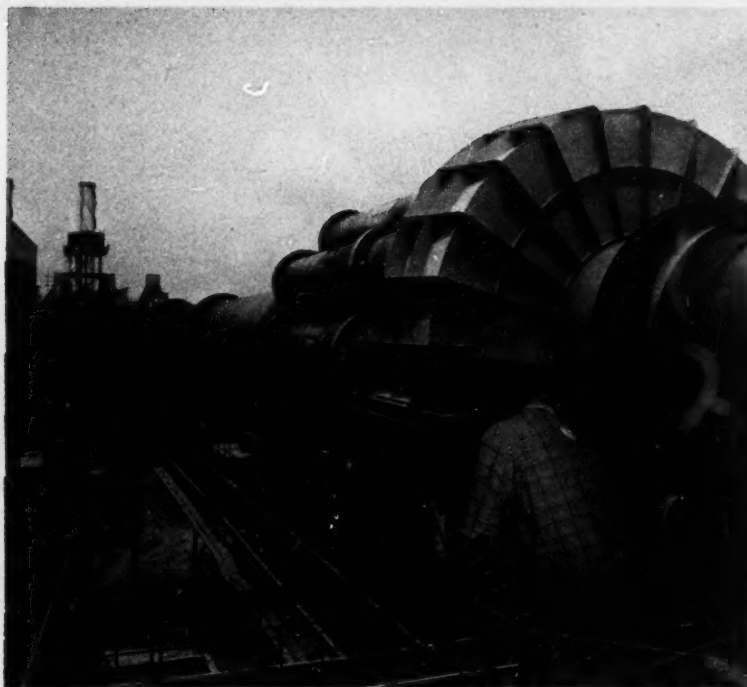
• Hawari: The Libyan Cement Co. New 1 million tpy plant equipped with Humboldt preheater system. Equipment supplier: Humboldt Wedag. Electrical equipment supplier: Brown Boveri. Consulting engineers: Prospective Engineering Gestion. Placed onstream: 1978.

• Near Homs: National Cement & Building Materials Co. New 3,000 tpd dry process plant due onstream in 1979. Major equipment supplied by Fives-Cail Babcock (France) includes: four-stage cyclone preheater; 5.4m × 88m rotary kiln; grate cooler; 1,300 tph crusher for limestone and clay; 80 tph crusher for gypsum and iron ore; 270 tph raw grinding unit; clinker grinding station with two 100 tph closed-circuit ball mills.

Madagascar, Democratic Republic of (Malagasy Republic)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.058	0.070	0.052	0.06	0.06

Quantities in million metric tons



NIGERIA: West African Portland Cement Co. Ltd. Shagamu works. Second kiln (rated at 650,000 mtpy) of projected six-kiln plant, now onstream (Courtesy: Blue Circle Industries Limited)

• E.S. Cement d'Antsirabe (Ibity, Province of Antsirabe). Contract awarded to Loesche GmbH for construction of new vertical kiln cement plant rated at 115,000 mtpy. Scheduled onstream in 1981.

Malawi

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.115	0.085	0.094	—	—

Mali

• At Astro (400 km west of Bamako). New dry process plant will be rated at 250,000 mtpy. Consulting engineers: Prospective Engineering Gestion. Scheduled onstream: 1983.

Morocco

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
2.028	2.216	2.604	3.9	4.8

• Rabat—Asment de Temara S.A. Capacity: 500,000 mtpy. Scheduled onstream: 1979. Consulting engineer: Technip and Lafarge Conseils et Etudes. Special adviser to the client and start-up supervisor: The SNC Group. Major equipment, supplied by the Fuller Co., includes 15 ft. x 220 ft. rotary kiln; four-stage suspension preheater; 3.962 x 13.4m raw mill; 3.962 x

Quantities in million metric tons

12.929m finish mill; inclined grate clinker cooler; dust collectors; pneumatic conveying system.

• Oujda—Cimenterie de l'Oriental. New 1 million mtpy dry process plant at Oujda incorporates two Polysius Dopol preheater kilns. The Blue Circle Group provided consultancy services. Plant scheduled for 1979 operation.

• Casablanca: Societe Nationale des Matériaux de Construction awarded contract for a new 1 million mtpy dry process plant to be built near Casablanca. The Blue Circle Group will provide the consultancy service. Operation is scheduled for 1980.

Mozambique

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.180	0.217	0.325	—	—

Niger

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.017	0.035	0.036	0.035	0.1

Nigeria

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
1.380	1.274	1.250	3.4	5.2

• Ashaka Cement Co.—Two-kiln plant, rated at 800,000 mtpy, near Ashaka on the Gongola River. Onstream: 1979. Blue Circle Group participated as man-

agement partners on project. Each Polysius Gepol preheater kiln is rated at 1,150 mtpd.

• Benue Cement Co. Ltd.—Yandev plant. New plant incorporating two production lines rated at 1,450 mtpd clinker each. Start-up scheduled for 1979. Major equipment, supplied by Humboldt Wedag, includes: two 4.4 x 64m rotary kilns equipped with four-stage Humboldt preheaters; two 4.4 x 8m tube mills for raw meal grinding.

• West African Portland Cement Co.: Shagamu (near Lagos) works. Designed to incorporate up to six kilns, of which two are installed. The first kiln was commissioned in 1977. The second kiln, rated at 650,000 mtpy, went onstream in 1978. Designers and builders: The Associated Portland Cement Manufacturers Limited (parent company of the Blue Circle Group). Equipment for a third 1,000 tpd production line has been ordered from F. L. Smidth.

• Upkilla Cement Co.—At Auch: 300,000 tpy extension onstream in 1978. Incorporates a Polysius Gepol kiln. Owner's representative: The SNC Group (Canada).

Rhodesia, Southern

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.677	0.541	0.486	0.6	0.6

Senegal

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.361	0.386	0.330	0.35	0.38

South Africa, Republic of

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
7.176	7.046	6.573	8.6	8.6

Sudan

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.216	0.164	0.180	0.3	0.6

• Maspio Cement Corp.: Expanding Atbara plant. Major equipment, supplied by F. L. Smidth, includes: one 750 tpd rotary kiln, 15 ft. x 12½ ft. x 329 ft., with single-stage cyclone preheater and Unax planetary cooler; 10½ ft. x 30 ft. raw mill; 11 ft. x 36 ft. finish mill.

Tanzania

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.266	0.244	0.247	0.6	1.3

• Tanzania Saruji Corp.: Building a new plant at Tanga (in northeastern Tanzania). F. L.

Smidth supplying major equipment, including: one 1,600 tpd kiln, 15 ft. x 224 ft., with four-stage cyclone preheater and Unax planetary cooler; 15 ft. x 25 ft. raw mill; 14½ ft. x 43 ft. finish mill. Scheduled onstream in 1980.

• **Tanzania Saruji Corp.:** Awarded contract to F. L. Smidth to supply equipment for new 800 tpd plant at Mbeya in southwestern Tanzania. Major equipment includes: 4 x 6m, 1250 kW raw mill; 3.95 x 58m, 800 mtpd rotary equipped with a four-stage cyclone preheater and Unax planetary cooler; 3.4 x 12m, 1820 kW finish mill. Scheduled onstream in 1980.

Togo (see West Africa)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.150	0.157	0.239	—	1.2

• **Ciments du Togo:** Lome, Togo. Extending capacity of clinker grinding plant from 300,000 mtpy to 500,000 mtpy. Scheduled for completion in 1981. Consulting engineers: Prospective Engineering Gestion.

Tunisia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.616	0.485	0.615	1.25	3.0

• **Societe des Industries Cimentieres du Centre (SICC)** has signed a contract with Holderbank Management and Consulting Ltd. for the engineering and

project management of a cement plant to be built near Enfida (100 km east of Tunisia). The plant will be rated at 1 million tpy. Production is slated for 1982 start-up. Equipment will be supplied by Kawasaki Heavy Industries in cooperation with C. Itoh & Co. and Marubeni Corp. Pyroprocessing unit will include a Kawasaki suspension preheater.

• **Djebel Oum El Khelil cement plant:** 3,000 tpd clinker dry process plant scheduled for operation in 1979. Major equipment, being supplied by Fives-Cail Babcock, includes: 5.4 x 96m rotary kiln equipped with four-stage twin cyclone preheater; 5 x 16.25m, 230 tph raw mill; 4.6 x 15.25m, 140-tph finish mill.

• **Les Ciments de Bizerte:** Bizerte. Expansion via one dry process 700,000 mtpy kiln. Contractor: F. L. Smidth. Consulting engineer: Lafarge Conseils et Etudes. Start-up: 1978. Equipment, supplied by F. L. Smidth, includes: MPS mill; a 5.25 x 178m rotary kiln with two-stage cyclone preheater; two 44 x 13m Unidan mills, an electrofilter; and a Fluxo packer.

• **Ciments Tunisiens:** Planning 1 million mtpy dry process plant in the Tunis area, at Djebel Oust. Lafarge Conseils et Etudes will act as engineering consultant for the study and supervision of construction.

Uganda

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.098	0.088	0.090	—	0.45

• **Uganda Cement Corp.:** Hima (near Zaire border). Adding 600 tpd production line. Contract awarded to Humboldt Wedag. Dry process, using a preheater, 50 x 3.6m rotary kiln and a grate cooler.

West Africa (see Togo, Ghana, & Ivory Coast)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
—	—	—	—	1.5

• **Les Ciments de l'Afrique de l'Ouest** has been formed by the West African governments of Togo, Ghana, and the Ivory Coast to build a 1.2 million tpy cement plant near Tabligo, Togo. The Blue Circle Group (Great Britain) has the contract for the engineering services. Polysius is supplying major equipment, including two 2,100 tpd clinker kilns equipped with planetary coolers. Scheduled onstream in 1979.

Zaire

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.628	0.534	0.488	1.1	1.1

• Planning expansion of cement plant in Shaba.

Zambia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.452	0.460	0.480	—	0.7

• Planning extension of Zambian cement plant.

ASIA

Afghanistan

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.120	0.157	0.157	—	0.9

• In Kandahar region: New 1,600 mtpd plant scheduled for 1979 operation. Contract awarded to consortium consisting of Fuller Co., Fischbach-Moore International, and Oman Construction. Pyroprocessing system will include two preheater-equipped rotary kilns.

Bahrain

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
—	0.082	0.140	—	—

• Clinker grinding plant only.

Bangladesh

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.102	0.227	0.308	—	—

Burma

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.181	0.229	0.255	54	0.54

China, People's Republic of

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
46.9	49.1	51.5	54	—

• **Hopewell Holdings Ltd.** in Hong Kong has contracted to build a new cement plant in China, partly to export cement and partly to provide cement to the growing Chinese domestic market. Cost of the plant, to be built by an as yet unidentified Japanese contractor, is put at around \$100 million.

• **F. L. Smidth** has received orders for 37 Symetro gears of various sizes for motor outputs

ranging from 800 kW to 2000 kW. The gears, which are for the Chinese cement industry, will be supplied in 1979 and at the beginning of 1980.

Cyprus

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.611	1.026	1.074	1.2	1.2

Hong Kong

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.575	0.765	1.029	1.45	1.45

• **Kaiser Cement Corp.**, Oakland, Calif., has announced the formation of a new company to construct and operate a \$185 million cement plant in Hong Kong. The new firm, China Cement

Quantities in million metric tons

Company (Hong Kong), Ltd., will be managed by Kaiser Cement under a long-term contract.

At the outset, it will be owned 40% by Kaiser Cement and 60% by a consortium headed by Cheung Kong (Holdings), Ltd., a large development company in Hong Kong. The consortium initially will be owned two-thirds by Cheung Kong and one-third by Kiu Yip Investment Corp., Ltd., a company controlled in Beijing (Peking). The cement plant will utilize pulverized fly ash from a new power plant as one of its raw materials. Bendy Engineering Co. will provide preliminary engineering. When completed, the dry process plant will include raw material unloading and handling, preblending, raw grinding, homogenizing, a preheater-precalciner type kiln, clinker storage and cement grinding with storage and shipping facilities. Project scheduled for completion in 1982.

India

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
16,205	18,635	19,084	19.6	26

● **Coromandel Fertilizers Ltd.:** New 1 million mtpy dry process (precalcining system) plant will be built in the Cudappah district of Andhra Pradesh (South India). Consulting engineering contract awarded to Holtec Engineering (Holderbank Management & Consulting Ltd.).

● **Modi Rubber Ltd.:** Holtec Engineers have prepared a report for a new 1 million mtpy cement plant to be located in the Raipur district of Madhya Pradesh in Central India.

● **State Industrial Development Corp. of Kerala (South India):** Holtec Engineers have been retained by the corporation for the engineering of a new 1,200 mtpd cement plant to be built at Walayar in the Palghat District.

● **Narmada Cement Co.:** Jafarabad. New plant scheduled for 1981 startup. Fuller Co. supplying following equipment: 15 ft. x 220 ft. rotary kiln; SF-141 flash calciner (3,000 mtpd); 12½ ft. x 45 ft. finish ball mill; two raw roller mills; coal roller mill; grate clinker cooler.

● **Larsen & Toubro, Cement Machinery Div.:** Constructing

Quantities in million metric tons

3,200 mtpd dry process plant at Chandrapur, Maharashtra. The equipment will be based on the F. L. Smidth precalciner/kiln system. Scheduled onstream in 1982.

● **Hetauda Cement Industries Ltd.:** New 260,000 mtpy dry process plant to be built at Hetauda (west of Kathmandu), Nepal. Consulting engineers: Prospective Engineering Gestion.

● **Birla Jute Manufacturing Co. Ltd.:** Have placed an order with Larsen & Toubro and F. L. Smidth for an extension to their Patna plant. The new installation will comprise a 2,500 mtpd dry process production line with precalcining kiln, raw grinding department, raw meal homogenizing plant, kiln department, and coal grinding plant.

● **Century Spring & Manufacturing Co. Ltd.:** Larsen & Toubro supplying major equipment for a 2,400 mtpd dry process plant at Maihan Madhya Pradesh. Scheduled onstream: 1979.

● **Cement Corp. of India Ltd.:** Installing 600 tpd kiln with four-stage cyclone preheater and Unax cooler at Rajban, Himachal Pradesh (Northern Region). Supplier: Cement Machinery Div., Larsen & Toubro (Bombay) and F. L. Smidth. Scheduled onstream: 1979.

● **Cement Corp. of India Ltd.:** Installing three 1,200 tpd dry-process units at Neemuch, Akaltara and Yerguntla Himachal Pradesh (Western Region). Supplier: Cement Machinery Div., Larsen & Toubro (Bombay). Scheduled onstream: 1979.

● **J. K. Synthetics Ltd.:** Expansion at Nimbahera, Rajasthan. Equipment suppliers: Larsen & Toubro (Bombay) with F. L. Smidth. Major equipment includes 1,200 tpd, 14½ ft. x 210 ft. rotary kiln with four-stage cyclone preheater and Unax planetary cooler; 14 ft. x 23 ft. raw mill; and 12½ ft. x 36 ft. finish mill. Scheduled onstream: 1979.

● **Andhra Cement Co., Ltd.:** New dry process 1,200 tpd plant at Nadikudi in the Guntur District of Andhra Pradesh. Consultants: Techno Craft Engineering.

● **Tadpatri Cements Ltd.:** New 400,000 tpy plant at Tadpatri.

Consultants: Techno Craft Engineering Ltd.

● **Raasi Cement Co. Ltd.:** New 200,000 tpy cement plant at Wazeerabad in the Nalgonda District of Andhra Pradesh. Consultants: Techno Craft Engineering.

Indonesia

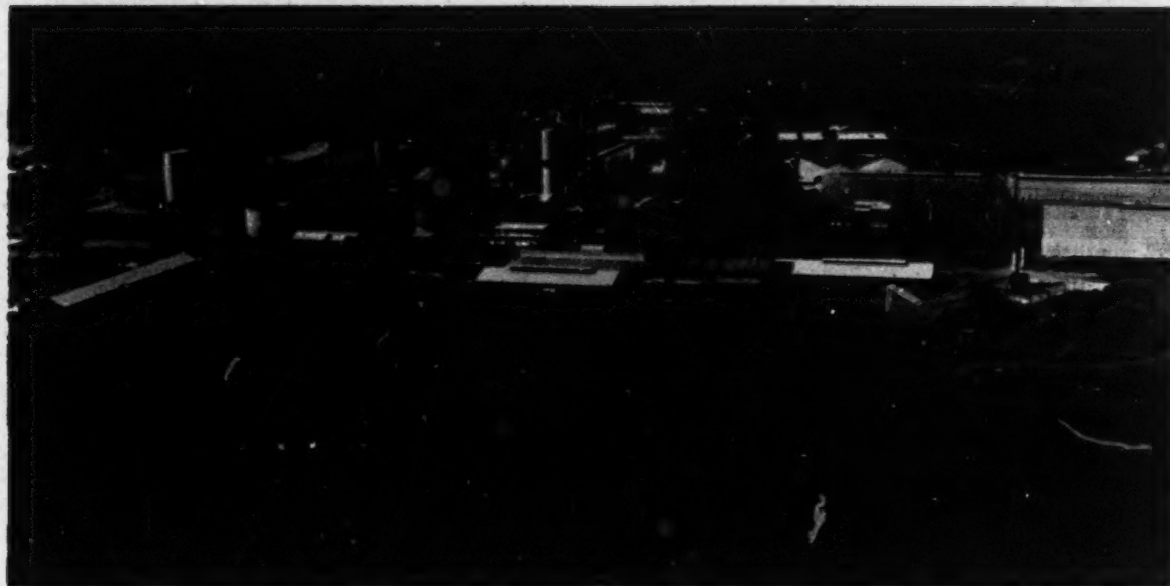
Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
1,085	1,806	2,678	4.3	6.4

● **P. T. Semen Gresik:** 3,200 mtpd expansion at Gresik Persero plant. Process engineering by Bendy Engineering Co.; design engineering by the H. K. Ferguson Co.; construction by Morrison-Knudsen International Co., Inc.; start-up and operating services by the H. K. Ferguson Co. and MKI, Inc. Equipment includes: two Polysius 4.6 x 74m-long rotary kilns with two 7.3m-diam. counterflow preheaters; three Allis-Chalmers 12½ ft. x 36 ft., 3,200 hp each, cement mills; one Kennedy Van Saun 11½ ft. diam. x 100 ft.-long rotary clay dryer rated at 80 tph; Kennedy Van Saun pneumatic conveying equipment and silo distribution and withdrawal systems; two Fuller Loesche roller mills, 135 mtpd each; two Fuller grate clinker coolers, 1,800 mtpd each; Fuller Air-Merge blending system with 1,975 metric ton cement silo capacity; three Fuller materials coolers. Onstream in 1978.

● **P. T. Semen Baturaja:** 500,000 mtpy plant at Baturaja, South Sumatra, is scheduled for completion in 1981.

● **P. T. Perkasa Indonesia Cement Enterprise (Indocement Group):** Cibinong, West Java. Adding a 3,200 tpd dry process production line. Major equipment suppliers are KHD Humboldt Wedag and Centunion (Spain). Production will be based on the Pyroclon process, using a 70 x 4.6m rotary kiln and a Humboldt twin-type preheater with secondary firing. Scheduled operation: 1980. A fourth production line with a 3,200 tpd output has been commissioned.

● **P. T. Semen Tonasa:** New 500,000 tpy plant projected for Biringere, Sulawesi. Scheduled operation: 1979. Engineering consultants: Dames & Moore. Major processing equipment, supplied



INDONESIA: P.T. Perkasa Indonesia Cement Enterprises—Cibinong, West Java. Adding a 3,200 mtpd dry process product line. (Courtesy: Humboldt Wedag)

by F. L. Smidth, includes: 4.75 × 75m rotary kiln with four-stage suspension preheater; 4150-hp Unidan finish grinding mill; FLS cement cooler.

• P. T. Semen Padang: New 2,000 tpd plant being built at Indarung, Western Sumatra. Major equipment, furnished by F. L. Smidth, includes: one 2,000 tpd, 16½ ft. × 263 ft. rotary kiln with four-stage cyclone preheater and Unax planetary cooler; 16 ft. × 28 ft. raw mill; 14½ ft. × 39 ft. finish mill. Bendy Engineering Co. and H. K. Ferguson International Co. were consulting engineers. H. K. Ferguson is technical consultant for construction and start-up. Scheduled onstream: 1979. Extensions planned to expand capacity with another 600,000 tpy by 1981.

Iran

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
5,000	5,400	7,000	14.3	16.8

Because of the political situation in Iran, the status of cement plant construction activity is not known. The latest available data appeared in the January 1979 issue of Pit & Quarry.

Iraq

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
2,200	2,385	2,800	6.7	7

• State Organization of Industrial Design & Construction: Awarded an order to construct a 1 million mtpy cement plant to Kawasaki Heavy Industries Ltd. and Marubeni Corp. The plant will be erected in Hit City (180 km west of Baghdad), using the Kawasaki suspension preheater system.

• Iraqi Cement Public Co.: A four kiln cement plant with a capacity of 2.3 million tpy at Kufa (100 miles south of Baghdad) was commissioned in 1978. The Government of Iraq awarded the contract for the installation to F. L. Smidth & Co.

• Public Company for Building Materials: Badoosh. Expansion via two 1,500 mtpd Polysius Gepol kilns. Onstream in 1978.

Israel

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
2,189	1,999	1,852	2	2.3

Japan (includes Ryukyu Islands)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
65,191	68,198	75,176	84.4	—

• Mitsui Cement Co.: Tagawa Works expansion via IHI SF precalcining system. Start-up of 5.0 × 75m kiln scheduled for 1979.

• Osaka Cement Co. Ltd.: Ibuki Works. Expansion via IHI SF precalcining system. Start-up of 2,700 mtpd, 3.8 × 79m kiln scheduled for 1979.

• Sumitomo Cement Co. Ltd.: Hachinohe Works expansion via IHI SF precalcining system. A 4.7 × 75m kiln start-up scheduled for 1979.

• Tokuyama Soda Co.: Nanyo Works expansion via addition of IHI SF precalcining system. A 5.7 × 110m kiln started up in 1978.

• Ube Kosan Co.: Kanda Works expansion via IHI SF precalcining system. Start-up of a 5.4/5.5 × 100m kiln scheduled for 1979.

METRIC CONVERSION FACTORS

feet (ft.) × 0.3048 → meters (m.)
miles × 1.6093 → kilometers (km.)
cubic feet (cu. ft.) × 0.0283 → cubic meters (cu. m.)
cubic yards (cu. yds.) × 0.7646 → cubic meters (cu. m.)
short tons (s.t.) × 0.9072 → metric tons (m.t.)
horsepower (U.S. (h.p.)) × 0.746 → metric horsepower (m.h.p.)
degrees Centigrade → 5/9 (degrees Fahrenheit - 32)



JAPAN: Osaka Cement Co. Ltd. Ibuki works. Precalcining system expansion adds 2,700 mtpd; 1979 startup. (Courtesy: IHI Inc.)

Jordan

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.572	0.533	0.501	1.2	1.2

• Kaiser Engineers, Inc. (subsidiary of Raymond International, Inc.) will provide consulting engineering and construction management services for a 1 million mtpy cement plant to be built at Rashadiya, midway between Amman and Aqaba. Scheduled completion: 1982.

• Jordan Cement Factories Co. Ltd.: Fuheis. Fifth kiln onstream in 1979 boosted production to 1.1 million mtpy. The kiln is a Polysius Dopol preheater unit. A sixth kiln is scheduled for operation in 1982.

• The board of directors of the joint Jordanian-Syrian Industrial Co. has decided to establish a plant for the production of white cement in Jordan.

Kampuchea (Cambodia)

Production and capacity data not available.

Quantities in million metric tons

Korea (North)

Democratic Peoples Republic

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
7,000	7,500	7,700	10	10.5

• North Korean Cement Industry: At Suncheon, a new plant with three production lines of 3,300 tpd each was placed in operation in 1978. F. L. Smidth supplied the major cement manufacturing equipment.

Korea (South), Republic of

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
10,129	11,873	14,418	15.1	20.3

• Union Corporation, Seoul, has entered into a contract with F. L. Smidth covering the supply of machinery and electrical equipment for a new 300 tpd white cement plant to be erected at a site 200 km southwest of Seoul. The order comprises a 3.45 x 60m rotary kiln with a two-stage cyclone preheater, Unax cooler and heat exchanger, a Tirax raw mill, and a Unidan cement mill, both with a Symetro gear.

• Ssang Yong Cement Industrial Co. Ltd. has awarded Polysius Corp. a contract for expansion of its Tonghae plant with a 8,400 mtpd installation. Major equipment will include: two 4.8m-dia. x 17m-long, 5,200-hp center discharge raw mills, each rated at 300 mtpd, and equipped with two 8m-dia. air separators; two Polysius Prepol cyclone preheaters with precalcining, rated at 4,200 mtpd each; two 5.2m-dia. x 70/102m-long rotary kilns with planetary coolers; coal-grinding plant consisting of a 4,100-hp, 4.8m-dia. x 15m-long double rotor mill, equipped with two 8m-dia. air separators; homogenizing system; two 4.8-dia. x 16.5m-long, 6,800-hp cement mills, rated at 150 mtpd, and equipped with two 6.5m-dia. air separators; process control equipment.

• Sung Shin Chemical Co. Ltd.—expanding Tanyang plant. Polysius is supplying major equipment, including: preheater kiln system rated for 3,000 mtpd with 5.0/4.8m x 60/89.5, kiln with planetary cooler; 5,200-hp raw grinding mill, 4.8m x 17m, rated for 290 mtpd; three cement mills, each 3,500 hp, 4.0 x 13.5m, rated for 75 mtpd at 3,200 Blaine.

• Tong Yang Cement (Seoul) has started an expansion program for its Sam Chok plant. Fuller Co. is supplying equipment, including: 48 x 60 in. jaw crusher; 42 in. gyratory crusher; two 10 ft. x 70 ft. rotary dryers; two 13 ft. x 45 ft. raw mills; two 16 ft. x 245 ft. rotary kilns with four-stage twin preheaters; clinker coolers; three 13 ft. x 45 ft. finish mills; plus blending, conveying and dust collecting equipment.

Kuwait

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.285	0.352	0.380	1.35	1.35

• Kuwait Cement Co.: Shuaiba. New 75,000 mtpy white cement plant scheduled onstream in 1979. Major equipment furnished by KHD Humboldt Wedag.

Lebanon

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
1.440	0.506	1.600	1.7	2.4

• Cimenterie National S.A.L.: Chekka. Polysius Dopol kiln, rated for 1,500 mtpd, onstream in 1978.

• Societe Libanaise des Ciments Blancs (S.L.C.B.) Chekka Works: Dry process extension for white cement of 100,000 mtpy. Complete design and engineering: Lafarge Conseils et Etudes (France). Start-up scheduled in 1979.

Malaysia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
1.428	1.586	1.740	2.4	2.5

• Associated Pan Malaysia Cement Sdn Bhd: New 1.2 million mtpy plant to be built on site of existing Rawang cement factory. Machinery will be supplied and erected by Ishikawajima Heavy Industries. Malayan Cement Berhad, a Blue Circle Industries subsidiary, has a 50% equity in the project.

Mongolia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.185	0.144	0.150	—	—

Nepal

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.030	0.036	0.040	0.050	0.050

• Onoda Engineering and Construction Co. has been awarded a contract for construction of a 250,000 mtpy cement plant in Nepal, with completion scheduled for 1981.

Oman, Sultanate of

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.250	0.300	0.392		

• Oman Cement Co. is setting up a 1 million mtpy plant in the Muscat region. Production is scheduled to start in 1982.

Pakistan

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
3.225	2.980	3.175	3.8	4.1

• Mustehkam Cement Ltd.: Adding a 300,000 tpy dry process, one kiln unit. KHD Humboldt Wedag Industrieanlagen is supplying the major equipment. Scheduled onstream in 1979.

• Javedan Cement Ltd. (State Cement Corp. of Pakistan) Javedan. Adding a 300,000 tpy dry process, one kiln unit. Fuller Co. supplying major equipment, including: 13½ ft. × 190 ft. rotary kiln with four-stage preheater; 12 ft. × 26 ft. raw mill; 12 ft. × 37 ft. finish mill; clinker cooler; pneumatic conveyor; dust collectors; and auxiliary equipment. Start-up expected: 1979.

• Pak-Iran Cement: New 300,000 tpy plant scheduled for 1980 operation in Darwaza (Baluchistan).

• In Kohat (NWFP): New 300,000 tpy plant scheduled for 1980 operation.

• Early in 1979 the Government of Pakistan engaged the joint venture of Bendy Engineering Co., USA, and Industrial & Cement Engineering, Ltd., Pakistan, to prepare a feasibility study for the establishment of a new cement plant near Nizampur in Pakistan.

Philippines

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
4.351	4.229	4.112	6.7	6.7

Qatar

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.164	0.179	0.176	0.3	0.3

Saudi Arabia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
1.250	1.300	1.350	3.2	3.8

• Buraidah Cement Co. (Qassim) will build a 2,000 tpd plant near Buraidah (400 km northwest of Riyadh). Equipment will be furnished by KHD Humboldt Wedag. Operation is scheduled for 1980. Binladen-Kaiser, a Saudi Arabian affiliate of Kaiser

Engineers, Inc., is consulting engineer for the project.

• Saudi-Bahraini Cement Co. has awarded a contract to Ishikawajima-Harima Heavy Industries Co., Ltd. (IHI), Japan, for construction of a 6,000 mtpd plant at Abgeig (about 100 km west of Damman). Operation is scheduled for 1981. Four 1,500 mtpd kilns will be installed. Holderbank Management & Consulting Ltd. is acting as consultant for this project.

• Saudi Cement Co. expanded its Hoffuf cement works in eastern Saudi Arabia with a new 1 million mtpy cement installation onstream in 1978. The equipment, supplied by Polysius, included two 1,500 mtpd dry kilns.

• Saudi Kuwaiti Cement Manufacturing Co. building new 7,000 tpd plant on the Arabian Gulf Coast. Prospective Engineering Gestion (Switzerland) is consulting engineer for the project. Plant is scheduled to be operational in 1983.

• Southern Province Cement Co.: New 5,000 mtpd plant to be erected at plant site 35 km east of the Red Sea, 60 km southeast of the city of Gizan, and 11 km from the Yemen border. The joint-venture turnkey contract was awarded to the Fuller Co. and Hyundai International, Inc. (Korea). Consulting firm was Basse Sambre-E.R.I., S.A. The plant has been designed with two cement manufacturing systems side-by-side, each with a capacity of 2,500 mtpd. Major equipment incorporated in the process includes two 42 in. gyratory crushers, two 6,000-hp, 15 ft. × 42 ft.-long raw ball mills, a blending and kiln feed system, two 14 ft. 6 in. × 210 ft.-long kilns, two preheaters with flash calciners, two clinker coolers, as well as two 7,000-hp, 15 ft. × 48 ft.-long finish ball mills. Scheduled start-up: 1981.

• Yamama Saudi Cement Co. Ltd.: Riyadh. Expansion via two 1,500 mtpd dry process Polysius kilns, onstream in 1978.

• Yanbu Cement Co. Ltd.—new plant to be built near Ra's Baridi (at the Red Sea). Contract for construction was issued to KHD Industrieanlagen Humboldt Wedag AG (W. Germany).

Plant will have two production lines with daily output of 3,000 tons of clinker, and is scheduled to go on stream in 1980.

• Yanbu Cement Co. and Arabian Cement Co., both of Jidda, have awarded a consulting job for planning, construction, and equipment installation for two new cement plants to Naigai Consulting Co., subsidiary of Onoda Cement Co., Japan. The mills will be built near Jidda and have a production capacity of 1 million tpy. KHD Industrieanlagen Humboldt Wedag is the major equipment supplier.

• Jizan Cement Co.: Two 2,500 mtpd precalciner kilns under construction in Southern Province. Major equipment supplier is Fuller Hyundai, as a joint venture.

Singapore

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
1.320	1.500	1.415	2.6	2.6

Sri Lanka

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.394	0.422	0.400	0.7	0.7

Syria (Syrian Arab Republic)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.994	1.110	1.395	1.6	2

• Adra Cement Co.: New plant at Adra with two production lines, each with 1,000 tpd dry process kiln. Scheduled onstream in 1979. Plant and equipment supplied by ZAB/SKET of the German Democratic Republic.

• Tartous Cement Co.: Two 600 tpd dry process kilns to come onstream at Tartous in 1980.

Taiwan

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
6.795	8.757	10.334	13	14

• Asia Cement Corp.: Hualien. Adding a 3,000 tpd production line, using KHD Humboldt Wedag Pyroclon process (short rotary kiln and twin-type preheater with secondary firing system). Scheduled onstream in 1980.

• Chia Hsin Cement Corp.: Kangshan plant. Expansion expected to start up in 1980. Fuller Co. supplying following equipment: one 15 ft. × 220 ft. rotary kiln; one preheater; one flash calciner; one Fuller-Loesche roller mill; one clinker grate cooler; blending system.



UNITED ARAB EMIRATES:
Union Cement Co. Ltd.
Third kiln will add 1,500 tpy in expansion program at Ras al Khaimah (Courtesy: IHI Inc.)

• **Hsin-Hsin Cement Co.** (Taipei) has awarded a contract to Polysius Corp. for a 2,220 mtpd cement plant. Major equipment will include: 3,200-hp center discharge raw mill, 4.4m-dia. × 15m-long, with two 6m-dia. air separators; cyclone preheater with precalcining system; 4m-dia. × 65m-long rotary kiln; traveling grate cooler; 5,200-hp cement mill, 4.4m-dia. × 16m-long, rated at 120 mtph, with two 6m-dia. air separators; homogenizing system; central control system; pneumatic equipment; bagging plant. Scheduled to be onstream in 1979.

• **Taiwan Cement Co.** has signed a contract with F. L. Smidth for an extension of the Suao plant. The order covers a 3,200 tpd rotary kiln with a four stage preheater and a precalciner, a Folax cooler, and a coal mill. Scheduled onstream: 1980.

• **China Rebar Co. Ltd.:** Tung Shan. Allis-Chalmers providing equipment and engineering services for conversion of MIAG-type suspension preheater to precalcining. Capacity will be increased from 2,400 to 3,000 mtpd. Start-up scheduled for 1980.

Thailand

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
3,990	4,450	5,000	4.5	4.5

• **Siam Cement Co. Ltd.:** Adding 4,000 tpd production line at Ta Luang (about 140 km from Bangkok). Equipment contract awarded to F. L. Smidth. The kiln will be of the dry process type with four stage preheater and separate precalciner. Other equipment includes: 3,050 kW raw

mill, homogenizing plant, Folax cooler, and electrostatic precipitator.

• **The Siam Cement Co. Ltd.** is expanding another plant at Tabkwang, Saraburi (approx. 130 km from Bangkok), by a new 4,000 tpd production line. Main machinery, to be supplied by F. L. Smidth, includes a 4.75 × 75 m rotary kiln with four stage cyclone preheater and separate precalciner, a Folax cooler, two raw mills, and two cement mills with Symetro gear.

• **Thai Lanna Cement Co.:** Planning 2,300 tpd plant to go into operation by 1981 in the Lampang area.

United Arab Emirate (Abu Dhabi, Dubai, Sharja, Ajman, Fujaira, Umm al Qualwan, Ras al Khaima)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.047	0.305	0.400	1.3	1.3

• **Gulf Cement Co.:** Ras al Khaimah. New 1 million mtpy cement plant to be built by UBE Industries of Japan. The W. S. Atkins Group will act as consultants for design and on-site supervision of construction. The project will utilize the UBE flash calciner system. Scheduled onstream in 1981.

• **Union Cement Co., Ltd.:** Ras al Khaimah. Third kiln of 1,500 tpd capacity is due onstream in 1980. Plant will incorporate Ishikawajima-Harima Heavy Industries Co., Inc. SF-type burning system (flash furnace/four-stage cyclone preheater/3.6m × 52m rotary kiln).

• **National Cement Co. Ltd.:** Dubai. New 1,500 tpd plant

onstream in 1978. The equipment for this wet process plant was furnished by Costain/F. L. Smidth; Holderbank Management & Consulting Co. Ltd. was consultant.

• **Al-Ain Cement Factory:** Al-Ain, Abu Dhabi. New 1,800 mtpd plant will use the IHI (Ishikawajima-Harima Heavy Industries Co., Ltd.) SF-type cement sintering system. Holderbank Management & Consulting Ltd. will act as consultant for planning and implementation of the project. Operation is scheduled for 1981.

• **Emirate of Fujairah** has awarded a construction contract to Voest-Alpine for a 1,600 tpd dry process plant. Kaiser Engineers, Inc. are the consultants on the project.

Vietnam

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.685	0.710	0.820	0.9	2.8

• **Technoimport** has contracted with F. L. Smidth to supply equipment for a new 3,100 tpd plant at Hoang Thach near Dong Trieu. Equipment includes a 775 tph crusher, blending and storage equipment for 43,000 tons of raw materials, an 18½ ft. × 23 ft., 3900-kW raw mill, an 18 ft. × 293 ft. kiln with four stage twin preheaters and planetary cooler; a 6,500-kW finish mill, 17 ft. × 46 ft.; and equipment for dispatch of cement in bulk and sacks. The system further includes equipment for advanced, computerized control systems.

• **Cimenterie de Ha Tien, Kien-Luong plant:** Technoimport has awarded a contract to French subsidiary of Polysius AG for addition of a Dopol kiln, complete with a precalcining system and auxiliary equipment, to the plant. The kiln will have a capacity of 1 million tpy and is scheduled for 1980 operation. Major equipment includes: one precalcining system rated for 3,000 mtpd with 4.8 × 60/89.5m kiln with planetary coolers; one 4,500-hp air-swept raw mill, 5.2 × 11m, rated for 240 mtph; two 4,200-hp cement mills, each 4.2 × 14m, rated for 90 mtph.

Yemen

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.080	0.080	0.100	—	—

• **Cement plant** is to be constructed at Bajil, near Hodeida, with a capacity of 200,000 tpy.

OCEANIA

Australia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
5,017	5,062	5,023	—	—

• Goliath Portland Cement Co., Ltd.: Railton, Tasmania plant expansion using Humboldt Wedag Pyroclon precalcination preheater system. Will double plant's production to 1 million mtpy. Scheduled for 1981 operation.

• Blue Circle Southern Cement Ltd.: Berrima plant expanded. F. L. Smidth, via licensee Vickers Ruwolt of Melbourne, was the supplier of major equipment, including: a 16½ ft. × 280 ft. rotary kiln, rated at 2,300 tpd, with four-stage cyclone preheater and

Blue Circle Cement Ltd. Berrima. Expansion rated at 2,300 mtpd scheduled for 1979 operation. (Courtesy: F.L. Smidth & Co.



Unax planetary cooler; and an 1,800 kW MPS raw mill. Start-up scheduled for 1979.

Fiji Islands

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.072	0.069	0.070	0.11	0.11

New Caledonia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.058	0.054	0.041	0.15	0.15

New Zealand

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
1.074	1.000	0.911	1.3	1.3

EUROPE

Albania

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.650	0.700	0.750	0.9	1

Austria

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
5,507	5,758	5,904	5,611	6.5

• Peggauer Zementwerke: Klagenfurt. Added Polysius Lepol kiln system with 3.8 × 3.6 × 54m rotary kiln rated at 800 mtpd. Scheduled onstream in 1978.

Belgium

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
6,884	7,504	7,764	7,576	—

Bulgaria

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
4,358	4,361	4,666	5.1	5.3

Czechoslovakia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
9,300	9,552	9,750	11.1	11.8

• Czechoslovak Cement Industry: Prachovice. Adding a 1.2 million tpy plant. Scheduled to go into operation in 1979.

Denmark

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
2,062	2,270	2,151	2,537	2.7

Quantities in million metric tons

Finland

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
2,063	1,825	1,736	1,718	2.7

France

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
30,657	30,567	30,352	30,335	32

• Ciments Francais: Erected 1,800 mtpd preheater kiln system at Bussac. Polysius Corp. supplied major equipment, including Dopol cyclone-type preheater; 4.6m × 70/90.3m long rotary kiln with planetary coolers; 4.2m dia. × 14.5m-long, 3300-hp center discharge raw mill; two 6.5m-dia. air separators. Onstream 1978.

• Ciments Lafarge France, Haubourdin Works: (500,000 mtpy)—Conversion from long, wet process kiln to semi-dry kiln with pressure filters to produce filter cake for the preheating Polysius Lepol grate kiln. Complete design and engineering: Lafarge Conseils et Etudes. Start-up scheduled: 1978.

Germany—East (German Democratic Republic)

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
10,653	11,345	12,163	12.5	13

Germany—West (Federal Republic of Germany)

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
32,975	33,832	31,871	32,993	45

• Dyckerhoff Zementwerke AG: Modifying clinker production line at Fortuna plant at Geseke by installing a KHD Humboldt Wedag Pyroclon preheater system to increase production from 800 to 1,500 mtpd.

• Dyckerhoff Zementwerke AG: Lengerich plant. Installing Polysius Prepol preheater with precalciner/kiln, rated at 1,500 mtpd.

Greece

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
7,770	8,592	10,467	11,333	12

• Halyps Cement Co. S.A.: Aspropyrgos. Adding one 1,500 tpd dry process kiln. Scheduled onstream: 1979.

• Titan Cement Co. S.A.: Karmari plant extension with a 3,000 tpd cement unit. F. L. Smidth supplying main machinery, including: 5 × 80m, 3,000 tpd rotary kiln equipped with a four-stage cyclone preheater and a Unax planetary cooler, 3,310 kW raw mill with air separator, 4.6 × 14m,

4,500 kW finish mill with air separator.

• Heracles General Cement Co. S.A.: Planning 1.5 million mtpy plant at Milaki in Euboea to replace Piraeus plant.

• Heracles General Cement Co., S.A.: Volos cement plant. Converting production lines four and five to the KHD Humboldt Wedag Pyroclon process. Clinker production line four, equipped with a single-line Humboldt preheater, increased from 1,700 to 2,100 mtpd; that of kiln line five, with a two-line preheater, increased from 2,300 to 3,000 mtpd.

Hungary

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
3.756	4.298	4.621	4.8	5.6

Iceland

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
0.164	0.144	0.139	0.133	—

Ireland

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
1.584	1.617	1.581	1.795	2.1

• Cement Ltd.—expansion at Platin plant added 1 million tpy capacity. Major equipment, supplied by F. L. Smidth, included an 18 ft. x 290 ft. rotary kiln, rated at 3,000 tpd and equipped with twin four-stage suspension preheaters and planetary cooler. Onstream in 1978.

Italy

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
34.625	36.624	38.439	38.493	39.7

Luxembourg

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
0.334	0.299	0.619	0.935	0.96

Netherlands

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
3.703	3.476	3.894	3.918	5

Norway

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
2.716	2.661	2.420	2.339	—

Poland

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
18.540	19.908	21.298	21.7	26.4

• Union of Cement Industry: Ozarow Cement Plant—New plant with two dry process kilns at 3,500 tpd each. Onstream: 1978. F. L. Smidth supplied main machinery, including two four-stage preheater kilns.

• Union of Cement Industry: Przyjazn—New plant with four dry process kilns of 1,600 tpd each.

• Union of Cement Industry: Strzeke Opolskie—New plant with four dry process kilns at 1,200 tpd each.

Portugal

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
3.441	3.749	4.413	5.163	6.1

• CIMPOR—Cimentos de Portugal E.P.: Expanding production line at the Souselas works (in the north of Coimbra). Major equipment to be supplied by Polysius. Will double capacity of plant to 2 million mtpy. Scheduled to go into operation in 1980.

Romania

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
11.520	12.548	13.700	14.2	17.5

Spain

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
24.404	25.961	29.422	32.064	35.5

• Hornos Ibericos S.A.: Contract awarded to KHD Humboldt Wedag to set up a cement plant in cooperation with Centunion Corp. (Madrid) near Carboneras, about 50 km east of Almeria. Capacity of unit mill be 3,000 tpd in a dry process rotary kiln with a Pyroclon preheater. Scheduled onstream in 1980.

• Cementos Portland S.A.: Olazagutia. Converting to Fuller SF process via an 1,800 mtpd flash calciner plus cooler expansion.

Sweden

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
3.346	2.819	2.578	2.370	3.8

• Cementa AB: Adding 4,700 mtpd production equipment to its Slite plant (on Gotland Island). Polysius Corp. is supplying major equipment, including: 2,400 hp double roller mill rated at 400 mtpd; 4.6/5.2m-dia. x 80m-long rotary kiln with precalcining and cyclone preheater unit; two 6,000 hp, 4.8m x 15.5m cement mills, each rated at 120 mtpd; homogenizing system. Start-up was scheduled for 1979.

Switzerland

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
3.722	3.546	3.649	3.698	6.2

Turkey

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
10.891	12.421	13.869	15.409	19

• Aslan Cimento A.S.: Darica plant expansion. Incorporates a Polysius Dopol kiln rated for 3,000 mtpd. Was scheduled onstream in 1978.

• Canakkale Cimento Sanayii A.S., Istanbul, awarded contract to Fuller Co. to supply the process equipment and engineering for a 2,500 mtpd cement plant. Completion is scheduled for 1979. Contract included 16½ ft. x 255 ft. rotary kiln and four-stage preheater, Fuller-Loesche roller mill, two finish mills, clinker cooler, kiln feed system, and blending system.

• The Aslan, Turkey plant of Aslan ve Eskihişar Muttahit Cimento ve su Kirechi Fabrikalari A.S. planned expansion of capacity from 480,000 mtpy to 1 million mtpy.

• A 500,000 mtpy cement mill will be constructed in Yozgat, Central Anatolia, Turkey. The mill was established by Yozgat Isci Viriligi Insaat Malzemesi ve Sanayi, a joint stock company formed in 1973. Lignite mined in Turkey will be used as fuel. Was scheduled onstream in 1978.

• Further expansion of cement production is planned in Turkey. The Cisan (Turkiye Cimento Sanayee T.A.S.), the Turkish national cement enterprise, has placed an order with the KHD Humboldt Wedag for the erection of seven cement plants. All plants will be dry process systems using Humboldt preheaters. The plants will be built according to one concept, retaining the same plant dimensions. Their clinker production will average about 1,750 mtpd with slight variations due to the different altitude levels of the plants and different raw materials deposits.

United Kingdom

Cement production			Cap. (est.)	
1975	1976	1977	1978	1979
17.575	16.357	16.054	16.584	19

• Ketton Portland Cement Co. Ltd.: Ketton. Expansion added 220,000 mtpy in 1978.

• Rugby Portland Cement Co. Ltd.: Rochester. Adding a 5.6 x 44m Polysius Lepol grate coupled with a 5.5 x 4.75 x 86m F. L. Smidth rotary kiln, with

Unax planetary coolers to produce a rated output of 2,200 mtpd of clinker. Semi-wet process to be used, utilizing pressure filters and sieve kneaders. Operation scheduled for 1980.

U.S.S.R.					Cap. (est.)
Cement production					
1975	1976	1977	1978	1979	
122,040	123,960	127,000	129.3	140	

Yugoslavia					Capacity (est.)
Cement production					
1975	1976	1977	1978	1979	
7,065	7,617	8,185	10.7	10.9	

- Dalmacija Cement: Expand-

ing Paitizan plant with 3,200 mtpd addition. Polysius Corp. furnishing major equipment, including: 3750 hp, 4.6m-dia. x 15.5m-long, center-discharge raw mill, equipped with two 6.5m-dia. air separators; 4.6m x 70m rotary kiln equipped with precalcining preheater; two 5400 hp, 4.4m-dia. x 16m-long cement mills, each rated at 100 mtpd. Was scheduled onstream: 1978.

- Fabrika Cementa Novi Popovac: Expanding Popovac

plant with a 2,000 tpd addition. Major equipment being supplied by F. L. Smidth and Pragoinvest includes: 16½ ft. x 263 ft. rotary kiln, rated at 2,000 tpd, equipped with four-stage cyclone preheater and Unax planetary cooler; 16 ft. x 27 ft., 2800-kw raw mill; 16 ft. x 46 ft., 5160-kw finish mill. Scheduled onstream: 1980.

- Tvornica Cementa Nasice: At Nasice. New 450,000 tpy dry process kiln. Was scheduled onstream: 1978.

NORTH AMERICA

Canada					Capacity (est.)
Cement production					
1975	1976	1977	1978	1979	
9,741	9,898	9,933	14.5	15	

• Canada Cement Lafarge Ltd.: Expanding plant at Exshaw, Alberta, to add 600,000 tpy. Equipment includes: F. Smidth gas-fired 3.95 x 56 m kiln, rated at 1,950 mtpd and equipped with a four-stage preheater with precalciner; Fuller 3.96 x 12.62 m, 3,700 hp, two-compartment raw mill; F. L. Smidth 4.60 x 14.02 m, 6,000 hp finish mill; Fuller clinker cooler; Wheelabrator electrostatic precipitator. Fuller-Kinyon conveying equipment. Operation is scheduled for 1980. Lafarge Consultants Ltd. are the engineering consultants for the expansion.

• Ciment Quebec, Inc.: St. Basile de Portneuf, Quebec. Plant expansion will replace existing 1,100 tpd wet process plant with a Fuller SF system rated at 2,000 tpd. Fuller Co. is furnishing major equipment, including: four-stage preheater with flash calciner; cooler; Fuller-Loesche airswep roller mill; blending equipment; Airslide conveying equipment; Fuller-Kinyon pumps; and dust collectors. Scheduled onstream in 1981.

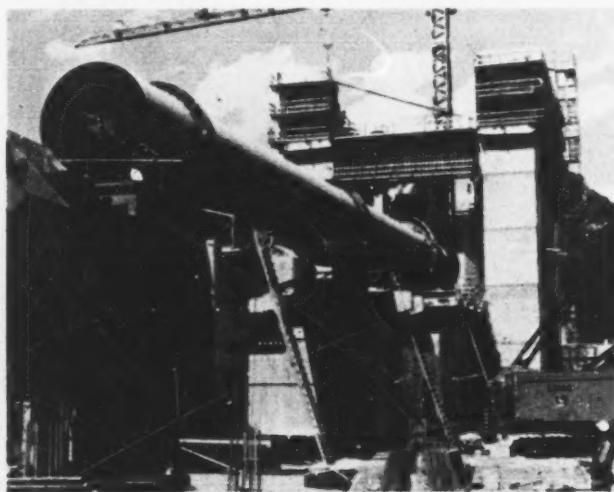
• Federal White Cement Ltd.: Woodstock, Ontario. New 100,000 tpy white cement plant onstream in 1979. Lafarge Consultants Ltd. handled design, engineering, project management, site supervision, training of personnel, and start-up assistance.

Quantities in million metric tons

• Inland Cement Industries Ltd. (Genstar Ltd. subsidiary): New 1 million tpy plant onstream in 1978 on Tilbury Island (near Vancouver, Delta, B.C.). Polysius Corp. supplied major equipment, including a 3,220 mtpd rotary kiln with a four-stage preheater and planetary cooler. Reid Crowther Bendy International provided the engineering design.

• Inland Cement Industries Ltd. (Genstar Ltd. subsidiary): Edmonton, Alberta. Plant expansion expected to start up in 1980. Equipment, furnished by Fuller Co., includes: four-stage preheater with flash calciner; 13½ ft. x 190 ft. rotary kiln; clinker cooler; blending equipment; Airslide conveyors; Fuller-Kinyon conveying equipment. Technical

CANADA:
Canada Cement
Lafarge Ltd.
—Exshaw, Alberta.
New 600,000 tpy
expansion due
onstream in 1980
(Courtesy: Lafarge
Consultants Ltd.)



CANADA:
Federal White
Cement Ltd.
Woodstock,
Ontario.
New 100,000 mtpy
white cement
plant placed
onstream in 1979
(Courtesy: Lafarge
Consultants Ltd.)



and engineering services provided by Blue Circle Industries Ltd.

• St. Marys Cement Co.: Plant expansion at St. Marys, Ont., onstream in 1978. Equipment added includes: F. L. Smidth 2,000 mtpd rotary kiln with four-stage suspension preheater and

planetary cooler; 15 ft. 6 in.-diam. Aerofall autogenous mill for clay drying. Allis-Chalmers roller mill. Reid Crowther Bendy International provided the engineering design.

• St. Lawrence Cement Co.: Mississauga, Ontario. Expanding via a Fuller SF flash calciner to

increase production from 3,000 to 4,500 mtpd. Adding cooler section and new kiln drive.

United States of America					Cap. (est.)
Cement production					1979
1975	1976	1977	1978	1979	
61.486	65.248	70.626	76.068	74.6	

U.S. developments are covered in a separate article in this issue.

CENTRAL AMERICA

Bahamas

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.450	0.350	0.200	—	—

Barbados

• Governments of Barbados and Guyana have signed a contract with Holderbank Consulting Ltd. (Canada) for engineering and project management of plant to be built on Barbados island. The plant is rated at 250,000 tpy and is scheduled for operation in 1980. Sixty percent of the clinker will be ground into cement in the Barbados plant; the other portion will be shipped to Guyana for grinding. In recent years, Barbados has imported 30,000-70,000 tpy of cement.

Costa Rica

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.298	0.362	0.400	0.6	1

• Corporacion Costarricense de Desarrollo: Building a new cement plant at Golfo de Nicoya (near Puntarenas). Allis-Chalmers will have process, equipment and engineering services responsibilities for the 1,300 mtpd dry process plant. Equipment will be supplied from the U.S. and Spain. The contract includes an Allis-Chalmers roller mill with 1,750 hp drive motor; suspension preheater; 14 ft. x 197 ft. rotary kiln; 8 ft. x 22 ft. inclined/10 ft. x 41 ft. horizontal stoker cooler; 13 ft. x 42 ft. finish grinding Compeb mill with a 4,000-hp motor. Scheduled onstream in 1980.

• Cementos Calhidra S.A.: New plant at San Jose will have capacity of 400 tpd, operating with dry process system, using a preheater. Kiln is a 3.4 x 40.5m unit. Equipment supplied by

Bühler-Miag (West Germany); engineering design by Ateinsa (Spain). Was due onstream in 1978.

Cuba

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
2.083	2.501	2.656	—	—

• Rene Arcay cement works: Mariel. Expansion, scheduled for 1978 operation, was to double capacity to 4,400 tpd. Humboldt-Wedag has furnished a two-shaft hammer crusher rated at 900 tph limestone. Engineering was provided by KHD Industrieanlagen AG in cooperation with Centunio (Madrid). In addition, a ship-loading installation is being built.

Dominican Republic

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.650	0.842	0.868	1.5	1.5

El Salvador

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.340	0.322	0.334	0.9	0.9

• Cemento de El Salvador S.A.: Dry process system expansion at El Ronco, Metapan plant onstream in 1979. Major equipment for this 1,000 mtpd addition, furnished by Allis-Chalmers, includes: 13½ ft. x 209 ft./273 ft. rotary kiln; 177 ft. high, four-stage preheater; satellite cooler consisting of nine 5½ ft. x 50 ft. tubes; 13 ft. x 22 ft. diaphragm ball mill; 12 ft. x 36 ft. Compeb-type finish mill.

• Cemento Maya S.A., Metapan Works, San Salvador: New plant with rated capacity of 800 tpd. Installed 3.6 x 52m rotary kiln equipped with a preheater. Major equipment furnished by Bühler-Miag; Ateinsa (Spain) provided engineering design. Was onstream in 1978.

Guatemala

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.389	0.445	0.489	0.5	0.8

• Cementos Progreso S.A.: Expanding San Miguel plant with a 1,600 mtpd clinker production line. Start-up was scheduled for 1979. F. L. Smidth is supplying the major equipment, including: 4.55m-dia. x 68/90m-long kiln; four-stage suspension preheater; 165 mtpd raw mill; 85 mtpd raw mill; 10 planetary cooler tubes; electrostatic precipitator; storage, material handling and shipping equipment. Bendy Engineering Co. performed engineering work.

Guadeloupe

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.146	0.131	0.133	—	—

Honduras

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.298	0.254	0.250	0.45	0.45

• Industria Cementera Hondurena, S.A.: Piedras Azules (north central Honduras). New plant under construction in 1979 for production of 1,200 metric tons per day of clinker plus more than 500,000 mtpy of portland and pozzolanic cement.

• Cementos de Honduras, S.A.: Rio Bajao. F. L. Smidth is furnishing the following equipment for a plant extension: Prehomogenizing section, Duodan raw mill, and a four-stage preheater/calciner Unax kiln rated at 2,000 tpd.

Haiti

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.144	0.246	0.257	0.3	0.3

Jamaica

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.407	0.365	0.333	0.4	0.8

Quantities in million metric tons

• **Caribbean Cement Co. Ltd.:** Expanding its Kingston plant with a 1,300 mtpd installation. Major equipment being supplied by Allis-Chalmers includes: a 14 ft. x 197 ft. rotary kiln with a suspension preheater; a cooler with an 8 ft. x 22 ft. inclined section and a 10 ft. x 42 ft. horizontal section; and a roller mill.

Martinique

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.113	0.119	0.129	—	—

Mexico

Cement production				Cap. (est.)
1975	1976	1977	1978	1979
11.612	12.584	13.277	14.5	16

• **Cemento Portland Nacional S.A. (Empresas Tolteca de Mexico, S.A. group):** Hermosillo, Sonora (plant is about 25 km from Hermosillo). New 1 million tpy plant scheduled to go onstream in 1981. F. L. Smidth will supply major equipment and also will erect and commission the plant. Engineering is being done by Blue Circle Industries, which has a 49% share in the company. The main FLS equipment consists of a 4.35 m. dia. x 66 m. kiln with single-stage, four-stage preheater and precalciner, Folax grate cooler, two 4.8 m. dia. x 8.57 m. long raw mills with 1800 B Symetro gears, two 4.8 m. x 12.5 m. long cement mills with 2020 BC Symetro gears, all arranged for closed-circuit grinding, crushing, homogenizing and dedusting equipment, all auxiliary and electrical equipment including instrumentation and control.

• **Cimentos de Chihuahua, S.A.:** Chihuahua, Chih. In conjunction with Sereland of Spain as engineer, Cementos de Chihuahua decided on a new clinker line of 1,700 tons per day capacity. F. L. Smidth & Co. received an order in 1979 for a kiln department, raw mill department and homogenizing department. The plant is expected to be ready in late 1981. The kiln is 4.55 m. dia. x 68 m. long, with a four-stage preheater and Unax planetary cooler. The raw mill is 4.8 m. dia. x 9.0 m. long with central discharge and two compartments, arranged for closed-circuit grinding.

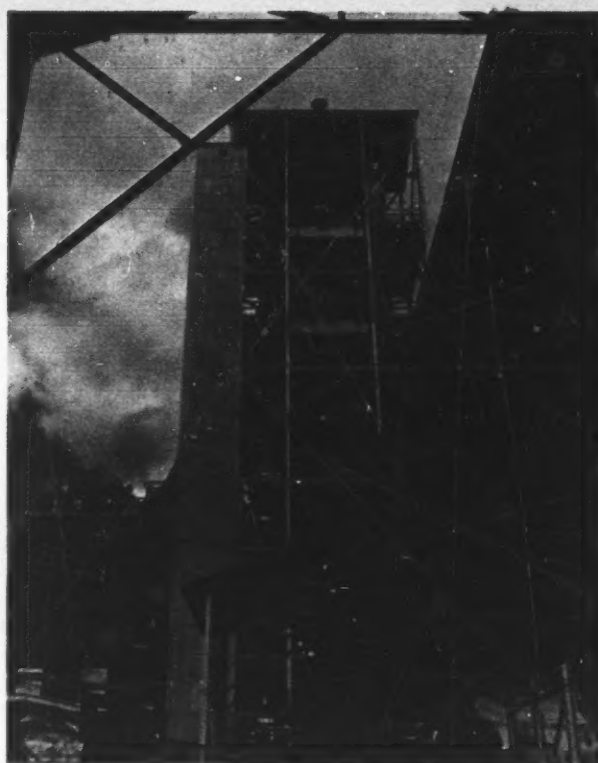
• **Cooperativa Manufacturera de Cemento Portland "La Cruz Azul," S.C.L.:** Cruz Azul, Hidalgo.

EL SALVADOR:

Cemento de El Salvador S.A.

Expansion rated at 1,000 mtpd scheduled for 1979 operation at El Ronco, Metapan plant

(Courtesy: Allis-Chalmers)



Plant expansion start-up was scheduled for 1979. Fuller Co. equipment supplied includes: 17 ft. x 270 ft. rotary kiln with four-stage twin preheater; clinker cooler; blending equipment.

• **Cooperativa Manufacturera de Cemento Portland "La Cruz Azul,"** Lagunas, Oaxaca. For this new plant, F. L. Smidth & Co. has received orders for a Tirax-Unidan raw mill of 4.6 m. dia. x 8 m. long, with a 1600 B Symetro central drive; also, two Unidan mills, each 3.8 m. dia. x 12 m. long with 1600 B Symetro central drives.

• **Cementos Mexicanos S.A.:** Valles, Est. San Luis Potosi. In the autumn of 1978, Cementos Mexicanos S.A. placed an order with F. L. Smidth for the main machinery for a 2,200 tpd expansion of their Valles plant. The equipment comprises a 4.15 x 58 m precalciner kiln with type 824S Folax cooler, a 4.6 x 7.6 m, 2200 kW raw mill, and a 4.6 x 14 m, 4400 kW cement mill, both with Symetros.

• **Cementos Mexicanos S.A.:** Monterrey, Est. Nuevo Leon. At the beginning of 1979, Cementos Mexicanos S.A. followed up their Valles expansion project with a similar extension of their Monterrey plant. The new kiln and

associated raw mill and cement mill will be identical to the F. L. Smidth Valles equipment.

• **Cementos Mexicanos S.A.:** Torreon, Est. Coahuila: Cementos Mexicanos S.A. put the third kiln in their Torreon plant into operation in August 1979. F. L. Smidth supplied a 4.55 x 68 m kiln with four-stage preheater, Unax cooler and TUM 4.6 x 7.6 m raw mill with Symetro gear.

• **Cementos Maya S.A.** commissioned their second production line in the Merida, Yucatan plant in the autumn of 1978. The 4.55 x 127 m two-stage cyclone preheater kiln, the TUM 4.6 x 7.6 m raw mill with Symetro, and the UM 3.8 x 11.2 m cement mill with Symetro were supplied by F. L. Smidth.

• **Cementos Guadalajara S.A.** put a new production line into operation at their Ensenada, Baja California plant during October 1979. The equipment comprises a four-stage preheater kiln with Unax planetary cooler, a TUM 4.6 x 7.6 m, 2200 kW raw mill and a UM 3.8 x 11.2 m, 2,200 kW cement mill, both with Symetros. The main machinery was supplied by F. L. Smidth.

Cementos Apasco S.A. has placed an order with F. L. Smidth for equipment for a new 2,200 tpd

cement plant at Macuspana in the state of Tabasco. The order includes a 4.15 x 58 m rotary kiln, a Tirax mill, and a Unidan mill. Operation scheduled for 1980.

• Cementos Vera Cruz S.A. (Empresas Tolteca de Mexico, S.A. group): Orizaba, Vera Cruz. Installing one Polysius Prepol preheater with precalcining/kiln, rated at 4200 mtpd.

Nicaragua

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.202	0.226	0.226	0.35	0.35

Panama

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.300	0.282	0.270	0.4	0.6

• Empresa Estatal de Cemento "Bayano" at Calzada Larga, north of Panama City, started produc-

tion in 1978. All equipment was supplied by F. L. Smidth on a turnkey basis; it includes an MPS roller mill, a 1,000 tpd kiln with four-stage cyclone preheater and a Unax planetary cooler, finish mill, and packing plant.

Trinidad and Tobago

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.255	0.238	0.215	—	—

SOUTH AMERICA

ECUADOR:
La Cemento Nacional.
Expansion of
Cerro Blanco plant
via a 1,500 mtpd
addition:
scheduled for
1979 operation
(Courtesy:
Allis-Chalmers)



Argentina

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
5.464	5.712	6.002	9	9

• Company Cementos Noa: Province of Salta. Planning construction of 1,800 mtpd plant.

• Juan Minetti S.A.: New 540,000 mtpy plant scheduled for operation in 1980. Major equipment supplied by KHD Humboldt Wedag and cooperating partner Centunion (Spain) will include: 4.4 x 64 m rotary kiln; 4.0 x 13 m, 2,790 kW clinker grinding mill rated at 100 tpd.

• Loma Negra Compania In-

dustrial Argentina, S.A.—Olivaria: Expansion being performed by Polysius. Includes: modification of existing long, dry kiln to two-stage preheater unit; capacity increase from 1,200 mtpd to 1,600 mtpd; modification of existing Polysius preheater to precalcining; capacity increase from 2,400 to 3,500 mtpd; one 4,000-hp cement mill, 4.2 x 14 m, rated for 80 mtpd at 2900 Blaine.

• Cemento Noroeste: La Rioja province. Projected new plant with a capacity of 350,000 mtpy.

• Corp. Cementera Argentina

S.A.: Capdeville plant. Expansion incorporating F. L. Smidth 2,000-tpd kiln with a four-stage cyclone preheater and a Folax grate cooler.

• Corp. Cementera Argentina S.A.: Yocsina plant. Adding F. L. Smidth four-stage cyclone preheater.

• Calera Avellaneda S.A.: Olavarria. Converting second production line to the KHD Humboldt Wedag Pyroclon process for raw meal precalcining. Modification will raise clinker production rate of that line from 1,000 mtpd to 1,500 mtpd.

Bolivia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.227	0.220	0.153	0.5	0.8

• Compania Boliviana de Cemento S.A.M.: Irpa plant expansion via a dry process 600 tpd kiln.

• Fabrica Nacional de Cemento S.A.: Cal Orcke plant expansion via one 200,000 tpy dry process kiln.

• Sociedad Boliviana de Cemento S.A.: Viacha plant expansion via a 500 tpd F. L. Smidth dry process kiln, onstream in 1979.

• Lafarge Consultoria e Estudios, subsidiary of Lafarge Conseils et Etudes (Lafarge Group) for Latin America, has been awarded a consulting engineering contract in Bolivia for the construction of the new Yacuces cement plant in the province of Chiquitos, Department of Santa Cruz. The contract was awarded by the Corporacion Regional de Desarrollo (Regional Development Agency) of Santa Cruz. The new dry process plant will have an annual clinker production ca-

Quantities in million metric tons

capacity of 335,000 tons, and the kiln will be equipped with a cyclone preheater. Start-up is scheduled for 1982.

Brazil

Cement production					Cap. (est.)
1975	1976	1977	1978	1979	1979
16.737	19.147	21.123	22.5	25.5	

• **Cimento Maua, S.A.** ("CNC"***): Cantagalo, State of Rio de Janeiro. New plant, scheduled onstream in 1980, has been designed for a 700,000 mtpy production. Equipment to be supplied by a consortium of F. L. Smidth and Christiani-Nielsen will include a 3.95×56 m precalciner kiln with Folax grate cooler; a 5.2×9.75 m raw mill; and a 3.8×12 m cement mill. CNC and Lafarge Consultoria e Estudos (Brazil) are the consulting engineers on the project.

• **Camargo Correa Industrial S.A.:** Expanding Apiai, Sao Paulo plant with a 3,500 tpd precalciner-preheater kiln addition. Expansion will also include crushing, grinding, material handling, and shipping equipment. Engineering design to be provided by Bendy-Teixera Engenharia Ltda. of Rio de Janeiro. Scheduled completion: 1980.

• **Cimento Itau do Parana S.A.:** Rio Branco do Sul, Parana plant, is doubling capacity. F. L. Smidth is supplying new equipment, including: 4.15×60 m kiln with four-stage preheater and Unax planetary cooler; 4×7 m raw mill; 4×12 m cement mill.

• **Cia de Cimento Portland Gaucho:** Pinheiro Machado, Rio Grande do Sul plant expansion via one 200,000-tpy dry process kiln. Was scheduled onstream in 1979.

• **Cia de Cimento Portland**

***"CNC"—*Companhia Nacional de Cimento Portland (CNC) was formed in 1979 by Lafarge S.A. of France and Lone Star Industries, Inc. of U.S.A., to bring together two Lafarge and two Lone Star plants in Brazil under this new CNC name. The four cement plants already in production are located in Guaxindiba, near Rio de Janeiro (Lone Star's subsidiary, the old Companhia Nacional de Cimento Portland); Aratu, in the State of Bahia (Lone Star's subsidiary Cimento Aratu, S.A.); Belo Horizonte, State of Minas Gerais (Lafarge's Companhia Mineira de Cimento Portland); Arcos, State of Minas Gerais (Cimento Portland Pains). Newest addition to the group is Cimento Maua, now being built.*

Poty: Sao Jose Paulista. Pernambuco plant expansion via one 2,000 tpd dry process kiln. Scheduled operation: 1980.

• **Cia Materiais Sulfurosos-Matsulfur:** Montes Claros, Minas Gerais plant expansion via a F. L. Smidth 2,000 tpd dry process kiln. Scheduled operation: 1979.

• **Cimento Tocantins S.A.:** So-bradinho plant expansion planned via a 1,000 tpd dry process kiln.

• **Cimenvale—Mineracao e Cimento Vale do Itajai S.A.:** New plant at Brusque, Santa Catarina, under construction.

• **Ciminas—Cimento Nacional de Minas S.A.:** Doubling of present capacity of Pedro Leopoldo plant under consideration.

• **Cia. Agro-Industrial de Monte Alegre:** New plant with one wet process 1,000 tpd kiln was due onstream in 1979.

• **Cia Cearense de Cimento Portland:** Sobral, Ceara plant expansion with one F. L. Smidth 1,000 tpd dry process kiln. Was scheduled onstream: 1979.

• **Cia de Cimento Atol:** Sao Miguel dos Campos Alagoas. New plant with one 750 tpd dry process kiln. Onstream in 1977. Major equipment supplied by Fives-Cail Babcock in partnership with Brazilian subsidiary Fives Lille do Brasil S.A. Major equipment includes: 3.6 m×51 m rotary kiln with a cyclone preheater; combined raw grinding and drying ball mill; two 1065 kW clinker ball mills.

• **Cia de Cimento Portland Goias:** Sorocaba. In 1978, purchased following Polysius equipment: Dopol 4.0×3.6×54 m preheater kiln rated at 800 mtpd, with Recupol grate cooler; 3.4×12.25 m raw mill rated at 95 mtpd with one 6.5 m diam. separator; 3.8×14.5 m cement mill rated at 68 mtpd.

• **Cia de Cimento Portland de Sergipe:** New plant with one 1,000 tpd dry process kiln at Laranjeiras, Sergipe. Was scheduled onstream in 1979.

• **Ibaci—Industria Barbalhense de Cimento Portland S.A.:** Barbalha, Ceara. New 60,000 tpy plant with one dry process kiln. Was scheduled onstream in 1978.

• **Cimento Santa Rita:** Itapevi

cement works. Increasing capacity of No. 4 kiln line from present 800 mtpd to 1,350 mtpd by addition of Humboldt Wedag Pyroclon system for precalcination of raw meal. Equipment and installation to be provided by a consortium of KHD Humboldt Wedag and Zanini of Brazil.

Chile

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.939	0.963	1.126	1.1	1.3

Colombia

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
3.154	3.622	3.430	5	5

• **Acerias Paz del Rio:** Setting up a 600,000 tpy slag cement plant at Belencito, province of Boyaca. Major equipment suppliers are Kawasaki Heavy Industries Ltd. and Marubeni Corp. Completion is scheduled for 1980.

• **Fabrica de Cimento Samper, S.A.** has awarded a contract to F. L. Smidth for the extension of its La Calera plant, 30 km from Bogota. The 1,500 tpd production line includes a 1,500 tpd 5.0×165 m rotary kiln with two-stage cyclone preheater and Unax planetary cooler.

• **Cementos del Caribe, S.A.:** Barranquilla. Expanding wet process plant with Allis-Chalmers 14 ft.×12.5 ft.×450 ft., 800 mtpd kiln and Allis-Chalmers 900 mtpd stoker-type cooler. Scheduled to be in operation in 1980.

Ecuador

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.593	0.608	0.623	1	1.4

• **Empresa Cementos Selva Alegre S.A.:** Building a 345,000 mtpy plant at Otavalo, which was scheduled for start-up in 1979. Allis-Chalmers Canada Ltd. is furnishing major equipment, including: 206 ft.-high preheater, 14 ½ ft.×204 ft. rotary kiln, stoker cooler, raw and finish grinding mills. SNC Inc. of Montreal is acting as the engineer/manager.

• **La Cemento Nacional:** Guayaquil. Expanding Cerro Blanco plant. F. L. Smidth supplying the following major equipment for a 1,500 mtpd addition: 4.35×66 m kiln equipped with a single-string, four-stage preheater; Folax grate cooler; 4.6×8.25 m Tirax Unidan raw



VENEZUELA: Cementos Catatumba. New 600,000 tpy expansion in State of Zulia is scheduled for 1980 operation. (Courtesy: Lafarge Consultants Ltd.)

mill; continuous silo blending system; dust collectors. Scheduled onstream in 1980.

• **Empresa Industrias Guapan S.A.:** Azogues. New plant scheduled for 1980 start-up. Equipment, to be supplied by Fuller Co., includes: one 13 ft. 6 in. x 190 ft. rotary kiln; 1,100-mtpd suspension preheater; 13 ft. dia. x 26 ft. Aerofall raw mill; 12 ft. dia. x 37 ft., two-compartment finish mill; air-quenching grate cooler; blending silo aeration system; Airslide fluidizing gravity conveying systems; Fuller-Kinyon pumps; Plenum-Pulse dust collectors; central control console.

Paraguay

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.138	0.155	0.200	0.7	0.7

Peru

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
1.950	1.966	2.100	3.1	4.1

• **Cementos Lima S.A.:** 3,000 tpd expansion at Atacunga plant (near Lima); was scheduled onstream in 1979. Major equipment includes: precalciner kiln; 6,000-hp raw mill; 6,000-hp cement mill. Holderbank Consulting Ltd. (Canada) holds the engineering work contract.

• **Cementos Norte Pacasmayo:** Expanding Pacasmayo plant from 1,000 to 3,000 mtpd, with completion scheduled for 1979. Fuller Co. has equipment contract, which includes: raw and finish open-circuit mills; 13 ft. x 190 ft. rotary kiln; preheater with flash

calciners; coolers; dust collectors; fluidizing conveyors; and blending equipment.

• **Cemento Yura S.A.:** Arequipa. Adding one 1,000 tpd dry process kiln. Fuller Co. supplied the following equipment: one 12 ft. x 37 ft. raw mill; one blending system; one 12 ft. x 37 ft. finish mill; five Plenum Pulse dust collectors. Start-up was expected in 1979.

Surinam

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.031	0.052	0.047	0.06	0.06

Uruguay

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
0.632	0.678	0.691	0.75	0.75

• **Administración Nacional de Combustibles Alcohol y Portland (ANCAP):** Adding 500 mtpd system to its existing 400 mtpd plant in Paysandu. Major equipment, supplied by Fuller-GATX (Pty) Ltd. of South Africa, includes: rotary kiln, four-stage preheater, clinker cooler, mills, blenders, pneumatic conveyors, dust collection equipment. Start-up was scheduled for 1979.

Venezuela

Cement production			Capacity (est.)	
1975	1976	1977	1978	1979
3.466	3.475	3.408	5.2	8.1

• **Cementos Caribe:** Puerto Cumarebo (near Coro on northern coast of Venezuela). New 1 million mtpy plant onstream in 1979. Humboldt Wedag supplied major equipment, including: Pyroclon precalcining suspension pre-

heater; 17 ft. x 270 ft. rotary kiln section; planetary cooler. Holderbank Consulting Ltd. (Canada) provided engineering and management work.

• **Cementos Catatumba:** Building new 600,000 mtpy plant in State of Zulia. Lafarge Consultants Ltd. (Canada) has contract for design, procurement, project management, and start-up assistance. Creusot-Loire Entreprises will supply the major equipment, including preheater-equipped kiln. Scheduled onstream in 1980. Plant will be equipped with a four-stage preheater/precalciner rotary kiln, 145 tph raw mill, and 75 tph finish mill.

• **Cemento Andino S.A.:** Valera. In 1978, purchased following equipment from Polysius Corp.: precalcining system with 4.2 x 65m kiln rated for 1,800 mtpd; 4.4 x 10.5m raw mill rated for 138 mtpd, with two 5.2m-diam. separators; 4.0 x 13.5m cement mill rated for 90 tph, with two separators.

• **C.A. Venezolana de Cementos:** Pertigalete plant. Expansion in 1977 added one 800-tpd wet process kiln. Expansion scheduled for 1979 operation would incorporate a 2,700-tpd dry process kiln.

• **Consolidada de Cementos C.A.:** Expansion at San Sebastian, Est. Aragua plant via one 1,500 tpd dry process kiln. Was scheduled onstream in 1979. •

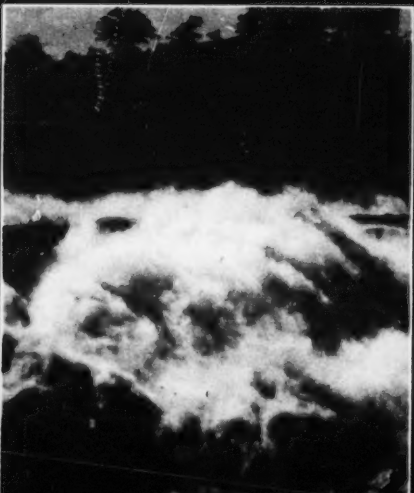
REFERENCES

- "European Annual Review: Data 1978/1979 Outlook," Publication No. 1, 1979, CEMBUREAU: The European Cement Association.
- "World Cement Market in Figures: 1913-1977," Statistical Review No. 35, Special Edition, CEMBUREAU: The European Cement Association.
- *Pit & Quarry*, Jan-Dec. 1979, Industry News Dept.
- 1978 Annual Reports
Asland S.A. (Spain)
Blue Circle Industries Limited (England)
Heracles General Cement Co. (Greece)
Holderbank Financiere Glaris Ltd. (Switzerland)
Polysius A.G. (West Germany)
- Private correspondence:
Allis-Chalmers; Asland S.A.; Bendy Engineering Co.; Blue Circle Industries Ltd.; Fuller Co.; Heracles General Cement Co.; Holderbank Management and Consulting Ltd.; Humboldt Wedag; IHI Inc.; Kaiser Engineers Inc.; Lafarge Consultants Ltd.; Polysius Corp.; Prospective Engineering Gestion; F.L. Smidth & Co., Inc.

PIT & QUARRY

February, 1980

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ON THIS MONTH'S COVER



Close blasting control a major effort in New England quarry. See page 46. Staff photos.

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Executive and Editorial Offices: 105 W. Adams St., Chicago, Illinois 60603. Phone (312) 726-7161.

PIT & QUARRY is published monthly. Copyright 1979 by Pit & Quarry Publications, Inc. Controlled circulation postage paid at Pontiac, Illinois 61764 and Chicago, Illinois 60607. In changing address, please give old as well as new address.

Subscription prices: U.S., U.S. Poss. and Canada, 1 Year \$18.00. All other countries, 1 Year \$50.00. Single copies: \$2.00 each to U.S., U.S. Poss. and Canada. All other countries, \$4.00 each. (payable in U.S. funds only)

Member of:
American Business Press, Inc.
Business Publications Audit of Circulation, Inc.

Associated Equipment Distributors

Pit & Quarry is indexed by Engineering Index, Inc.

Copies of back issues are available on microfilm from Xerox University Microfilms, 300 N. Zeeb Road, Ann Arbor, Michigan 48106.

INTERNATIONAL STANDARD SERIAL NUMBER: ISSN 0032-0293 (registered in National Serials Data Program, Library of Congress, Washington, D.C. 20540)

Postmaster: Please send form 3575 to Pit & Quarry Publications, Inc., 105 W. Adams St., Chicago, Illinois 60603

PIT & QUARRY

ISSN 0032-0293

The basic magazine in a basic industry

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Small new screen with big capability

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PIT & QUARRY / FEBRUARY, 1980 • 3



COMPARISON OF MONTHLY/YEAR-AGO CONSTRUCTION CONTRACT VALUES*

	1979 Nov.	1978 Nov.	% Change
Nonresidential Building	\$ 3,849,112	\$ 3,621,663	+ 6%
Residential Building	4,716,502	5,972,983	- 21
Nonbuilding Construction	2,184,898	2,040,317	+ 7
Total Construction	\$10,750,512	\$11,634,963	- 8%

	1979 11 mos.	1978 11 mos.	% Change
Nonresidential Building	\$ 46,309,007	\$ 42,022,075	+ 10%
Residential Building	70,430,678	70,207,717	0
Nonbuilding Construction	39,420,323	37,714,745	+ 5
Total Construction	\$156,160,008	\$149,944,537	+ 4%

DODGE INDEX

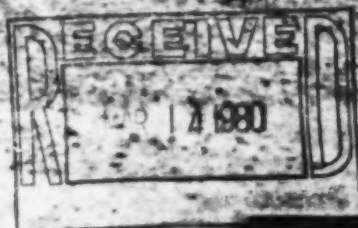
(1972 = 100, seasonally adjusted)

September, 1979 185 October, 1979 171 November, 1979 156

**Based on statistics compiled by the F. W. Dodge Div., McGraw-Hill Information Systems Co.*

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PIT & QUARRY



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ON THIS MONTH'S COVER



Bantamweight screen performs in heavyweight class for limestone quarrying operating in Virginia. See page 54.

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Executive and Editorial Offices: 105 W. Adams St., Chicago, Illinois 60603. Phone (312) 726-7151.

PIT & QUARRY is published monthly. Copyright 1979 by Pit & Quarry Publications, Inc. Controlled circulation postage paid at Pontiac, Illinois 61764 and Chicago, Illinois 60607. In changing address, please give old as well as new address.

Subscription prices: U.S., U.S. Poss. and Canada, 1 Year \$18.00. All other countries, 1 Year \$50.00. Single copies: \$2.00 each to U.S., U.S. Poss. and Canada. All other countries, \$4.00 each. (payable in U.S. funds only)

Member of:
American Business Press, Inc.
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Pit & Quarry is indexed by Engineering Index, Inc.

Copies of back issues are available on microfilm from Xerox University Microfilms, 300 N. Zeeb Road, Ann Arbor, Michigan 48106.

INTERNATIONAL STANDARD SERIAL NUMBER: ISSN 0032-0293 (registered in National Serials Data Program, Library of Congress, Washington, D.C. 20540)

Postmaster: Please send form 3579 to Pit & Quarry Publications, Inc., 105 W. Adams St., Chicago, Illinois 60603



PIT & QUARRY

ISSN 0032-0293

The basic magazine in a basic industry
PUBLISHED BY PIT AND QUARRY PUBLICATIONS, INC.,
AN EMPLOYEE-OWNED ORGANIZATION.

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Blasthole loading problems resolved in Florida

COMPARISON OF MONTHLY/YEAR-AGO CONSTRUCTION CONTRACT VALUES*

	<u>1979</u> <u>Dec.</u>	<u>1978</u> <u>Dec.</u>	<u>%</u> <u>Change</u>
Nonresidential Building	\$ 3,558,553	\$ 3,024,773	+ 18%
Residential Building	4,303,847	4,715,319	- 9
Nonbuilding Construction	<u>2,651,008</u>	<u>2,220,538</u>	<u>+ 19</u>
Total Construction	\$10,513,408	\$ 9,960,630	+ 6%

	<u>1979</u> <u>12 mos.</u>	<u>1978</u> <u>12 mos.</u>	<u>%</u> <u>Change</u>
Nonresidential Building	\$ 49,659,492	\$ 45,045,834	+ 10%
Residential Building	74,685,642	74,949,473	—
Nonbuilding Construction	<u>42,032,763</u>	<u>39,934,701</u>	<u>+ 5</u>
Total Construction	\$166,377,897	\$159,930,008	+ 4%

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(1972 = 100, seasonally adjusted)

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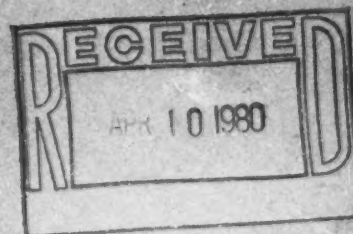
**Based on statistics compiled by the F.W. Dodge Div., McGraw-Hill Information Systems Co.*

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PIT & QUARRY

April, 1980

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ON THIS MONTH'S COVER



New firm brings historic old Tomkins Cove quarry in New York back to life with new 700-tph plant. See page 44. Photo courtesy L.B. Smith, Inc.

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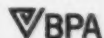
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INTERNATIONAL STANDARD SERIAL NUMBER: ISSN 0032-0293 (registered in National Serials Data Program, Library of Congress, Washington, D.C. 20540)

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PIT & QUARRY

ISSN 0032-0293

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Attendance tops
5,000 in Houston

AND NEXT MONTH

Special section with features on outstanding new lime plant installations, technology and aglime evaluation.

COMPARISON OF MONTHLY/YEAR-AGO CONSTRUCTION CONTRACT VALUES*

	1980 Jan.	1979 Jan.	% Change
Nonresidential Building	\$ 4,351.8	\$ 3,958.7	+ 10%
Residential Building	4,100.0	4,530.0	- 9
Nonbuilding Construction	2,628.4	3,297.6	- 20
Total Construction	\$11,080.2	\$11,786.3	- 6%

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(1972 = 100, seasonally adjusted)

November, 1979 156 December, 1979 183 January, 1980 190

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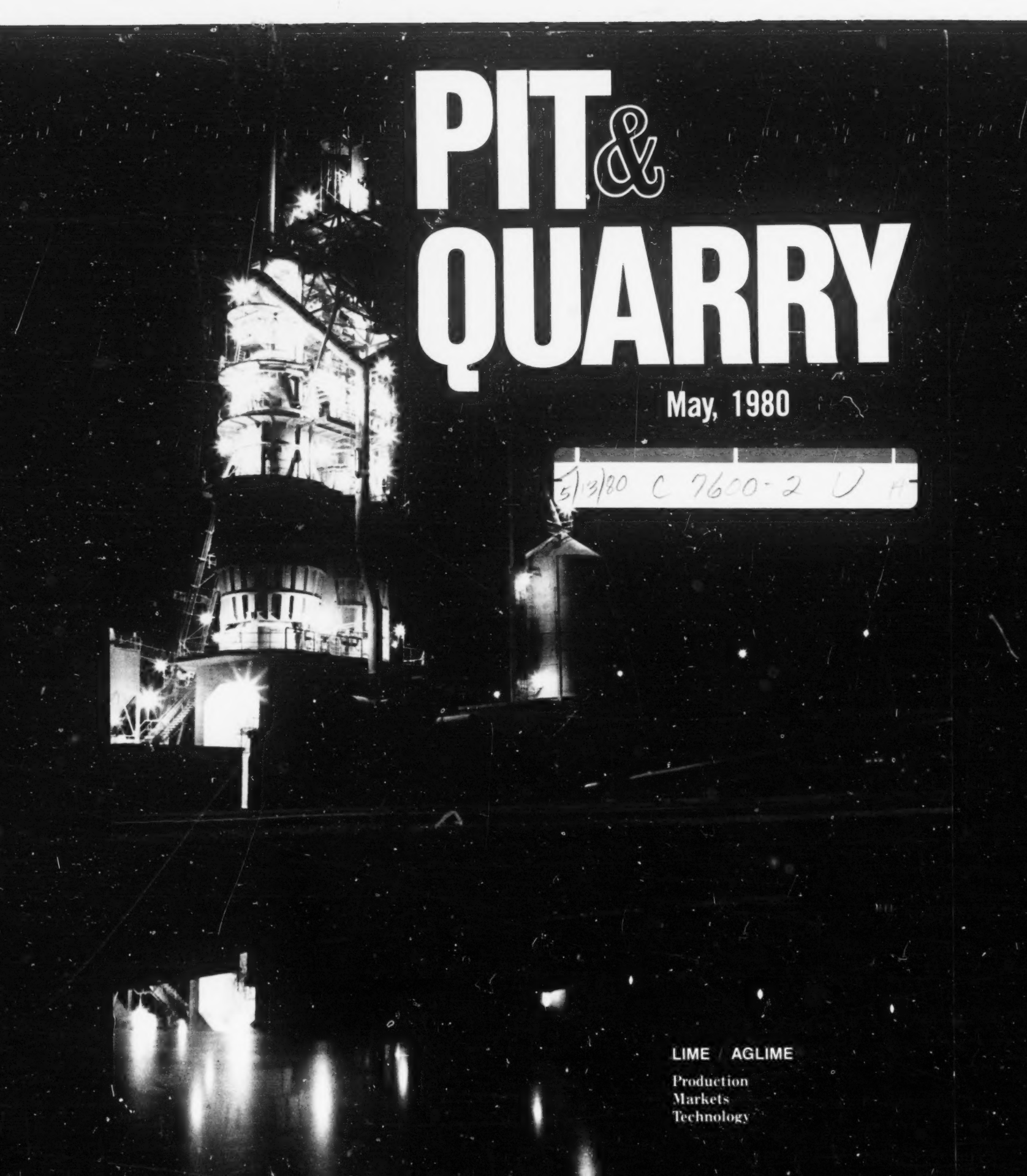
U.S. Gypsum's Shoals Plant Receives Lloyd Yeager Award

The United States Gypsum Company's Shoals, Ind. plant recently became the first member company plant of the Gypsum Association to receive the Lloyd H. Yeager Award commemorating two million or more employee hours without a lost workday case. The inscribed award plaque honoring this outstanding safety achievement was presented to Donald N. McCoy, works manager.

The Yeager Award is one of many to be earned by McCoy and his employees. The Shoals plant has won the Gypsum Association Presidential Division Award for the last two consecutive years, the No Lost Workday Case Award for 13 of the 23 years the facility has been in operation, and innumerable Certificates of Achievement recognizing the safety records of individual departments within the plant. One of the most prestigious awards received by the Shoals facility is the Sentinel of

Safety Award, an annual award given to the metal and nonmetal mine with the best safety record in the nation. This trophy, sponsored jointly by the American Mining Congress and the U.S. Mine Safety and Health Administration, was presented in April 1979.

The Lloyd H. Yeager Award, named in honor of the former Gypsum Association executive vice president whose vision and leadership inspired the creation of early industry safety programs, is presented to member company gypsum plants achieving a record of one million or more employee hours without a lost workday case. Fewer than 20 plants have qualified for this honor in its 12 year history.



PIT & QUARRY

May, 1980

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LIME / AGLIME

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ON THIS MONTH'S COVER

Night falls on a two-shafted Schmid-Hofer kiln, first of its type in North America, at the Arizona installation of Paul Lime Div., Can-Am Corp. See pg. 57.



MEMBER

VBPA

☆ABP

COMPARISON OF MONTHLY/YEAR-AGO CONSTRUCTION CONTRACT VALUES*

	1980 Feb.	1979 Feb.	% Change
Nonresidential Building	\$ 3,634.8	\$ 3,231.6	+ 12
Residential Building	4,337.4	4,588.1	- 5
Nonbuilding Construction	2,421.6	6,045.4	- 60
Total Construction	\$10,393.8	\$13,865.1	- 25

	1980 2 mos.	1979 2 mos.	% Change
Nonresidential Building	\$ 7,969.4	\$ 7,197.8	+ 11
Residential Building	8,430.9	9,119.2	- 8
Nonbuilding Construction	5,044.3	9,344.8	- 46
Total Construction	\$21,444.6	\$25,661.8	- 16

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(1972 = 100, seasonally adjusted)

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PIT & QUARRY

JUNE 1980

Bauma '80/Hannover:
We were there

6/9/80 C. 7600-2 J

14 m³

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AND NEXT MONTH

Pit & Quarry's annual Cement Issue will feature:

- Oregon Portland Cement's new 500,000 tpy plant
- Plant modernizations in Utah and South Dakota
- Cementos Caribe's new 3,000 tpd plant in northwestern Venezuela
- Cement and construction minerals industry—financial reports survey

ON THIS MONTH'S COVER

One of the literally thousands of exhibits at Bauma '80, the mammoth construction equipment show held every 3 years in Munich, Germany. See pictorial review and Editor's Page for comments about this international event that drew visitors from around the world.

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COMPARISON OF MONTHLY/YEAR-AGO CONSTRUCTION CONTRACT VALUES*

	<u>1980</u> <u>March</u>	<u>1979</u> <u>March</u>	<u>%</u> <u>Change</u>
Nonresidential Building	\$ 4,272.5	\$ 4,155.6	+ 3
Residential Building	4,384.5	6,984.2	- 34
Nonbuilding Construction	<u>2,428.7</u>	<u>3,818.5</u>	<u>- 36</u>
Total Construction	\$11,285.7	\$14,958.3	- 25

	<u>1980</u> <u>3 mos.</u>	<u>1979</u> <u>3 mos.</u>	<u>%</u> <u>Change</u>
Nonresidential Building	\$12,159.9	\$11,361.7	+ 7
Residential Building	13,003.0	16,111.0	- 19
Nonbuilding Construction	<u>7,454.0</u>	<u>13,163.0</u>	<u>- 43</u>
Total Construction	\$32,616.9	\$40,635.7	- 20

DODGE INDEX

(1972 = 100, seasonally adjusted)

January, 1980 190 February, 1980 171 March, 1980 155

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